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ABSTRACT

These three newsletters focus on advances and challenges in disability research. The first issue focuses on the results of a survey that investigated how many consumers with disabilities had a computer available in their home and their Internet use. The study involved administrators of Independent Living Centers (ILC) and ILC consumers. Findings indicate 85 percent of the stakeholders and 59 percent of consumers had a computer at home. Internet access at home was reported by 82 percent of the stakeholders and 48 percent of the consumers. Among all respondents, the computer was the most frequently identified source used to obtain disability research information in the past 12 months. Differences in findings among diverse cultural groups are discussed. The second issue examines the topic of designing and conducting research, as well as the dissemination and utilization of research outcomes, with diverse cultural groups in mind. Articles include "Strategies for Reaching Out to Minority Individuals with Disabilities" (Fabricio E. Balcazar), "Reaching Out to Minority Farmers with Disabilities" (Ari K. Mwachofi), and "Center for Minority Training and Capacity Building for Disability Research" (Irvine E. Epps and Darrell K. Simmons). The third issue focuses on accessibility of the World Wide Web. Articles include: "Web Accessibility: Today's Resources, Tomorrow's Challenges" (Judy Brewer), "Information Technology Technical Assistance and Training Center (ITTATC)" (Shelley Kaplan), "Section 508 Web Standards and WCAG Priority 1 Checkpoints: A Side-by-Side Comparison" (Jim Thatcher), "Accessible Multimedia and Distance Education Projects at NCAM" (Geoff Freed), and "Ability Forum.com Offers a Dissemination Avenue to Research Consumers" (Dawn Golden). (Articles include references.) (CR)

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Volume 6 • Number 1 • 2001

THE Research Exchange

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This newsletter is available in alternate formats upon request.

SEDL
Southwest Educational Development Laboratory

NIDRR
National Institute on Disability and Rehabilitation Research

NCDDR Survey 2000:
Computer and Internet Use

Implementing innovative dissemination techniques often inspires a desire to utilize the latest technology. Today, the personal computer no longer seems "new" and it provides an avenue for sharing information with any number of people, at any given time. But many people, including consumers with disabilities, may not have the latest tools. How many consumers with disabilities have a computer available in their home? And, of those, how many have connections to the Internet? In the NCDDR's previous consumer survey (NCDDR, 1997), the majority of respondents indicated that they *never* get information from the Internet (see **Figure 1**).

The *NCDDR Survey 2000* asked consumers and stakeholders if they have a computer in the home, and if they have Internet access at home. Other questions asked how often respondents use the Internet, and how often they find disability research information through the Internet. Respondents were asked about the purpose of their Internet use. The survey also asked respondents to identify sources used to obtain disability research information, and the ways they prefer to get disability research information. *Computer* was one response option for these last two questions, encompassing the Internet, World Wide Web, electronic mail, and CD-ROM.

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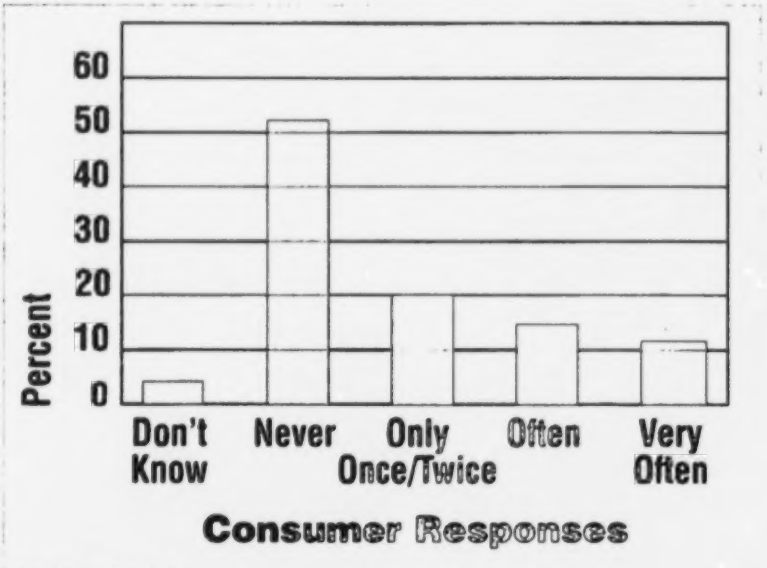
Figure 1



From NCDDR (1997). How do consumers get information they can use? *The Research Exchange, 2*(4), 1-8.

A Word from the Director

Expanding Our D&U Knowledge Base

The irony of living in the information age is that most of us are surrounded by a high volume of misinformation. We act on a growing number of untested assumptions in our daily lives. A need exists to periodically test or evaluate how much we really know in particular areas. The process commonly referred to as Dissemination and Utilization, or D&U, is one of those areas. Indeed, without periodic evaluation it is virtually impossible to have sufficient information to improve utilization outcomes by making improvements in your dissemination activities and strategies.

To help increase our knowledge base in the NIDRR community regarding D&U, the NCDDR has engaged in a continuing survey activity to identify, describe, and compare attitudinal and behavioral patterns across major groups invested in disability research, effective outreach, and beneficial impact of D&U efforts. Findings from annual NCDDR investigations should assist in suggesting strategies that are most effective in D&U for targeted groups and alternatives that the NCDDR and other NIDRR grantees can most effectively and efficiently employ in conducting more effective outreach efforts.

Our understanding of D&U has shifted in important ways in the NIDDR grantee community in recent years. The complexities and intricacies of knowledge utilization have become more widely recognized. Growing numbers of NIDRR grantees readily acknowledge that D&U is not inherently the simple movement of paper-based products from Point A to Point B. Our knowledge is increasing concerning the nature of utilization of new information as a phenomenon that requires us to know and be responsive to the individual characteristics of those that are intended users or beneficiaries of the information.

The utilization of new information is actually a part of the learning process. Effective D&U strategies must realize this and use activities that facilitate this learning process.

This issue of *The Research Exchange* highlights trends identified through a major survey effort conducted by NCDDR staff last year. It is hoped that these findings will provide some insights that you may not have had before. If you would like to have additional information on the NCDDR survey, a complete report is available to you upon request. Additionally, the NCDDR hopes to use this survey technique to continue to expand and enhance our understanding about D&U relevant to NIDRR grantees. We invite all NIDRR grantees to share with us concerns or issues that may be investigated through this methodology.

John D. Westbrook, Ph.D.
Director, NCDDR

NCDDR Survey 2000

1. Please check the disability research areas that are of most interest to you. (check all that apply)

Research on employment of people with disabilities (includes such things as policies, statistics, employment services, work supports, Americans with Disabilities Act)

Research on independent living and community integration for people with disabilities (includes such things as housing, transportation, community services and resources, education, social relationships, policies)

Health and function research for people with disabilities (includes specific disability areas such as blindness, spinal cord or traumatic brain injury, cerebral palsy, and others)

Research on assistive technology for people with disabilities (includes such things as devices, equipment, computer hardware and software, other resources.)

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NCDDR Survey 2000: Computer and Internet Use
continued from page 1

Results are reported for the overall stakeholder group and the overall consumer group. In some cases, subgroups within the consumer group are compared. Within the overall consumer group, some differences were observed for demographic variables related to race and ethnicity. Those findings are discussed elsewhere in this issue: "Access to Disability Research Information by Diverse Groups: Key Findings of NCDDR Survey 2000." The complete report, *NCDDR Survey 2000* (NCDDR, 2001), is available online: **http://www.ncddr.org/du/products/survey2000.html** or may be requested from the NCDDR in alternate formats.

The trends observed in the *NCDDR Survey 2000* regarding computer and Internet use are compared with the results of other studies on Internet use by people with disabilities. One study was produced by NIDRR's Disability Statistics Center (DSC), in Disability Statistics Report 13, *Computer and Internet Use Among People with Disabilities* (Kaye, 2000). The second was an Internet-based survey of 89 people to determine the participation level of people with disabilities in common online activities (Clark, 1999).

Computers at Home

- Eighty-five percent of stakeholders and 59 percent of consumers reported they have a computer at home.
- Within the group of consumers who have a computer at home, nearly two-thirds lived in urban/suburban settings compared to one-third who reported living in rural settings.

The data for the DSC's Disability Statistics Report 13 (Kaye, 2000) were from the Current Population Survey, 1998 Computer and Internet Use Supplement and 1999 Annual Demographic Supplement. These data showed lower numbers of people with disabilities who own computers. Twenty-four percent of people with a work disability had a computer at home, compared to 52 percent of people with no disability (Kaye, 2000). When the data were examined by age groups, the

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NCDDR Survey 2000: Overview

As part of its ongoing research activities, NCDDR conducted several national surveys during its pilot project phase (1995-1999) to establish a baseline about consumers' interest in disability research information as well as their ability to access such information. Responses were also gathered from stakeholder groups and NIDRR grantees to identify areas of consistency or gaps. Survey results showed that people with disabilities believed disability research information was useful to them, but they often did not know how to find such information.

In 2000, the focus was expanded to learn about consumer and stakeholder interest in specific disability research areas, their success in finding disability research information, and from what sources. Other questions asked about preferred information formats, including computer and Internet availability and use. Basic demographic data such as gender, ethnicity, race, disability, and geographic locale were gathered to see if differences were observed among these groups. Researchers were also asked about their dissemination practices.

Procedures

Following a pilot test, NCDDR staff contacted administrators of Independent Living Centers (ILCs) by telephone to invite their participation in the survey. The NCDDR asked the ILCs across the country to administer the survey to at least five individuals with disabilities. ILCAdministrators were also asked to complete a stakeholder survey. Survey materials were sent to ILCs, researchers, and other stakeholders.

Participants

Over 250 ILC administrators agreed to administer the consumer survey to five or more consumers with disabilities. The survey materials were also sent to 153 ILCs that NCDDR staff members were not able to contact directly. Spanish language, Braille, audio tape, computer disk, electronic mail, and large print alternate format versions were available. A total of 2,015 surveys were sent to ILC consumers; 2,622 surveys went to representatives of stakeholder groups, and 403 were sent to researchers. The overall response rate was 27 percent. The ILC consumers' response rate was 28 percent. Among the stakeholders, response rates ranged from just over 1 percent to 35 percent. Researchers had the highest response rate, 45 percent.

Results

The consumer questionnaire contained 12 questions and five optional demographic questions. Results were calculated in percentage of responses for each item. Areas of most interest included items about computer and Internet use, and comparison of results among different demographic groups related to race and ethnicity. These results are presented in this issue of *The Research Exchange*. To see the full report, please request a copy of *NCDDR Survey 2000* (NCDDR, 2001) or review the online version: **http://www.ncddr.org/du/products/survey2000.html**

NCDDR Survey 2000: Computer and Internet Use, *continued from page 3*

15-64 age group showed 33 percent of people with a work disability have a computer at home, compared to 56 percent of people with no disability who have a computer at home (Kaye, 2000). This age group is similar to the consumers who use the services of community-based independent living centers (ILCs) and who participated in the *NCDDR Survey 2000*.

Internet Access at Home

- Internet access at home was reported by 82 percent of stakeholders, and 48 percent of consumers.
- Within the subgroup of consumers who have a computer at home (59 percent of the overall consumer group), respondents with Internet access at home increased to 76 percent, compared to 5 percent for those who do not have a computer.

The DSC's Disability Statistics Report 13 showed lower rates of consumers with disabilities with Internet at home. Eleven percent of people with a work disability reported having Internet access at home, compared to 31 percent of people with no disability. For the 15-64 age group, Internet access at home was 16 percent for those with a work disability and 34 percent with no disability (Kaye, 2000).

Where and How Often People Use the Internet

- Among stakeholders, 85 percent reported using the Internet *at Work*, compared to 35 percent of the overall group of consumers. *At Home* use was the most frequent response for nearly half of all consumers, and was the second most frequent response for three-quarters of the stakeholder group. Nearly one-third of all consumers reported using the Internet *at ILCs*.
- Within the group of consumers who have computers at home, Internet use at Home increased to 74 percent. This group reported that 31 percent also use computers at ILCs, compared to 29 percent of consumers who do not have a computer at home.
- *Daily* use of the Internet was the most frequent response for 68 percent of stakeholders and 35 percent of consumers. Twenty-three percent of consumers overall and three percent of stakeholders reported they *do not use* the Internet.
- *Daily* Internet use was reported by 51 percent of the subgroup of consumers with a computer at home. The next most frequent response for this subgroup was *Very Often*, 22%, while eight percent responded *Never*. For consumers with no computer, the most frequent response was *Never*, 48 percent, followed by *Seldom*, 17 percent.

Using the Computer to Obtain Disability Research Information

- Among all survey respondents, *Computer* was the most frequently identified source used to obtain disability research information in the past 12 months. This response was selected by 85 percent of stakeholders. For the consumer group, *Computer* was the second most frequent response with 56 percent. The most frequent overall consumer response, *Newsletters, Brochures, and Fact Sheets*, was 62 percent.
- Within the subgroup of consumers with a computer at home, *Computer* was the most frequently cited response regarding the source used to obtain disability research information with 74 percent. However, *Newsletters, Brochures, and Fact Sheets* was the second most frequent response, with 63 percent. For the subgroup of consumers without a computer at home the most frequent response, 60 percent, was *Newsletters, Brochures, and Fact Sheets*. *Computer* was selected by 28 percent of this subgroup.
- *Computer* was the second most frequent response as a preferred way to obtain disability research information for both consumers and stakeholders overall. Eighty-two percent of stakeholders selected this response, slightly lower than the most frequent response, *Printed Materials*,

with 84 percent. For consumers, 61 percent responded they prefer the *Computer* while 72 percent identified *Printed Materials*.

For consumers with computers at home, 81 percent identified *Computer* most often as a preferred way to obtain disability research information, followed by *Printed Materials*, 70 percent. Consumers without a computer at home identified *Printed Materials* most often (76 percent), followed by *Video* (46 percent). *Computer* was reported by 32 percent of this consumer subgroup. Other responses regarding preferences such as *Audio, Braille,* and *Captioning*, were similar for both subgroups.

- Forty percent of stakeholders reported using the Internet *Often* to find disability research information, compared to 25 percent of consumers. The most frequent consumer response, 28 percent, was *Never*.
- Among the subgroup of consumers with a computer at home, the most frequent response, 33 percent, was *Often*. Fifteen percent responded that they *Never* use the Internet to find disability research information. Eight percent of consumers with a computer at home use the Internet *Daily* to find disability research information.
- Forty-nine percent of consumers without a computer at home indicated they *Never* use the Internet to find disability research information. The next most frequent response for this subgroup was *Seldom*, 17 percent.

Relevant Disability Research Areas

Other questions in the survey asked about respondents' interest in specific research areas and their experience in looking for and finding information during the past 12 months. Generally, consumers were less successful than stakeholders in finding information. The subgroup of consumers with a computer at home looked for disability research information at a higher rate and was more successful in finding information when compared to consumers with no computer at home. **Figure 2** shows some of these differences.

Purpose for Using the Internet

- In response to a question about specific activities on the Internet, *Searching for Information/Research* was the most frequent response for 89 percent of stakeholders and 58 percent of consumers. The second most frequent response was *Electronic Mail*, for 88 percent of stakeholders and 52 percent of consumers. *Job-related Tasks* was next for 66 percent of stakeholders. For consumers, the next most frequent responses were 38 percent for both *Locating Disability Organizations* and *Communicating with Friends/Family*.

Figure 3 shows results from the *NCDDR Survey 2000* compared with those of Clark's 1999 Internet study and the DSC's Disability Statistics Report 13 (Kaye,

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Figure 3
Reasons for Internet use, in percentage of respondents

Response	NCDDR Survey 2000		Clark (1)	Kaye (2)
	Stakeholders	Consumers		
Electronic mail	88	52	99	67
Searching for information/research	89	58	93	63
News/weather/sports/stocks/radio on the Web	30	23	36	39
Locating events in the community	26	22	33	
Locating disability organizations	54	38	39	
Communicating with disability organizations	48	28	40	
Reading online newspapers and magazines	29	21	65	
Socializing with others	15	22	55	
Communicating with friends/family	49	38	91	
Entertainment	19	31	64	
Online courses, help with schoolwork	11	10		29
Job-related tasks	66	31		26
Shop, pay bills, other commercial activities	29	16		17
Searching for jobs	22	18		16

(1) from Clark, J. (1999.) *Internet utilization by persons with disabilities.*
(2) from Kaye, H.S. (2000.) *Computer and Internet Use Among People with Disabilities.*

Figure 2
Percentage of consumers who looked for and found disability research information in the past 12 months

Research area	Consumers WITH computer at home		Consumers with NO computer at home	
	Looked for information	Found information	Looked for information	Found information
Employment of people with disabilities	48%	39%	42%	25%
Health and function	47%	36%	41%	26%
Assistive technology	46%	45%	35%	26%
Other	8%	6%	5%	3%
Not interested in disability research	2%		10%	

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2000). Although the three studies are very different in terms of strategies for data collection and sample size, it is interesting to observe the similarities and differences among responses. *Electronic mail* was reported to have high use in all three studies. Use of the Internet for *news, weather, and radio* was also similar.

How Stakeholders and Researchers Get Information to Consumers

Stakeholders and researchers (including NIDRR and OSEP grantees) were asked what ways they usually get information to their consumers. *Personal Communication* was the most frequent response for both groups (researchers 86 percent, stakeholders 82 percent). For researchers, the next most frequent response, 82 percent, was *Computer Online (Internet, World Wide Web)*. For stakeholders, the *Computer Online* was the third lowest response at 38 percent, above *Reports* (25 percent) and *Library/Information Holdings* (12 percent).

Summary

These initial results show changes in the increased availability and use of computers, especially by consumers. In the first NCDDR survey, 25 percent of consumers identified the computer as a preferred format for receiving information (NCDDR, 1997) compared to 61 percent in the current survey. Stakeholders reported an increase in computer use rising from 53 percent found previously (NCDDR, 1998) to 82 percent in the present study.

Regarding use of the Internet, 54 percent of consumers previously reported never getting information from the Internet (NCDDR, 1997). This figure dropped by over half, to 23 percent. Twenty-six percent of consumers in the initial survey reported using the Internet regularly (NCDDR, 1997), and this more than doubled to 65 percent in the *NCDDR Survey 2000*. Some differences were found in computer and Internet use when demographic variables were examined among the consumer group.

Researchers reported extensive use of the computer to get information to consumers. Stakeholders' use of the computer to get information out to consumers increased by about half, from 26 percent in the previous stakeholder survey (NCDDR, 1998), to 38 percent. Although the computer continues to grow as a way of sharing and finding information, approximately one-fourth of consumers reported they do not use computers or the Internet, and alternate ways must be utilized to get information to this audience. Printed materials, including newsletters and brochures, were frequently cited responses, among other formats reported to be preferred by consumers. It is important for those who want to get information to consumers to understand the needs of their target groups, and how the members of various groups prefer to get information they will use.

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Access to Disability Research Information by Diverse Groups: Key Findings of NCDDR Survey 2000

We live in an increasingly diverse world, and in order to effectively disseminate disability research information it is essential that we implement different strategies specifically geared for various target audiences. A key purpose of the NCDDR Survey 2000 was to obtain preliminary data on how consumers with disabilities who are also members of racial, ethnic, or cultural minority groups find and access disability research information. Reaching out to consumers from diverse backgrounds to learn how they typically access information that is useful in their daily lives is part of the process of effective dissemination. In a previous issue of *The Research Exchange* dealing with disability, diversity, and dissemination, we are reminded that:

> The ranks of under-represented groups in disability research include people with disabilities who are also members of racial, ethnic, or cultural minority groups. Frequently, dissemination strategies do not take into consideration the special factors that would enhance the utility of disability research to minority group target audience members. An understanding of the information and research needs of multicultural groups should be a basic, rather than peripheral, tenet of research and dissemination design.
>
> [*The Research Exchange*, Vol. 4, No. 1 (1999) "A Word from the Director"]

A key factor to remember when disseminating information to minority group members is that traditionally underrepresented groups are not composed of a homogeneous population, but rather are unique in their characteristics and cultural behaviors. These unique characteristics and behaviors may very well translate into the use of different mechanisms for obtaining information. What works best for one group may not necessarily work for other groups. For example, several studies have shown that minorities with disabilities and minorities in general often lack access to mainstream information resources such as computers and the Internet (Casey, Ross, & Warren, 1999; Cultural Access Group, 2001; Goslee, 1998; Kaye, 2000; Wilhelm, 1996). The research further indicates that specific groups such as African Americans, Hispanics, and American Indians differ in their access to and use of computers and the Internet. Reaching the various audiences would then entail identifying more appropriate and applicable formats and types of dissemination.

The *NCDDR Survey 2000* gathered data to learn more about the information needs of consumers with disabilities who are also members of minority groups. As part of the demographics section in the *NCDDR Survey 2000*, the respondents were asked to identify themselves according to categories used by the U. S. Census (2000). The respondents were asked: *"Are you Spanish/Hispanic/Latino?"* and *"Check one or more races to indicate what you consider yourself to be."* Respondents who selected more than one racial category to indicate mixed racial heritage were represented in each of the selected racial categories. The relative distribution of responses to the *NCDDR Survey 2000* indicated that 78 percent of consumers reported White; 12 percent reported Black or African American; and six percent reported American Indian or Alaska Native. Also, eight percent reported Hispanic and 87 percent reported non-Hispanic. The other racial categories (Asian, Native Hawaiian and other Pacific Islander) are not included due to negligible (one percent or less) response rates.

Although the results are based on relatively small samples, highlights of the *NCDDR Survey 2000* data suggest that consumers with disabilities who are also members of racial, ethnic, or cultural minority groups do, in fact, use a variety of sources and formats to obtain disability research information. Following are some key findings from the survey.

Relevant Disability Research Areas

- Over 75 percent of Hispanic respondents designated the areas of *Employment* and *Independent Living* as the most relevant disability research areas compared to non-Hispanic respondents who selected these topics less frequently. In addition, over 60 percent of the Hispanic respondents reported they actively looked for information on *Employment*.
- Among African American and American Indian respondents, over 50 percent indicated they had looked for information on *Employment* compared to 42 percent of White respondents. Success in locating *Employment* research information decreased for all groups–Hispanic (34%), American Indian (33%), African American (32%), and White (34%).

Indication of employment as a relevant research topic may be due to the prevalence of unemployment and underemployment among minorities with disabilities (Walker, Saravanabhavan, Williams, Brown & West, 1996). Currently, in order to access available employment-related information on minorities with disabilities, a review of reports and literature from a variety of sources is necessary. Moreover, the accessed information tends to be technical and jargon-filled. To this end, researchers who are currently working on employment-related issues can address the needs of minorities with disabilities in successfully obtaining employment-related information by providing highly accessible, user-friendly

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Access to Disability Research Information by Diverse Groups, *continued from page 7*

information in varying formats and through a variety of media. Providing increased levels of culturally and linguistically appropriate information would appear beneficial.

Obtaining Disability Research Information

- *Family or Friends* were selected as sources used to obtain information by 64 percent of the Hispanic respondents.
- Over 50 percent of American Indian respondents also selected *Family or Friends* compared to other groups who selected these topics less frequently.
- *Television* was selected by 43 percent of African American respondents compared to 37 percent of White respondents.

Selection of family and friends as a method for obtaining disability research information may be due to several reasons including, but not limited to, culturally-dictated close-knit family structures, sole acceptance of sensitive information from trusted individuals, unfamiliarity with multiple available information sources, and lack of understanding of language/jargon used by information sources (Correa, 1992). To disseminate research outcomes, researchers might consider using community-based initiatives or organizations that are trusted by the community of family and friends. Fullan (1991) contends that individuals are more prone to accept assistance, information, and new ideas from sources they know and trust. Generally, because of the strong local ties they have nurtured, community-based organizations linked to minority groups are good sources to use in spreading information.

Preferred Methods for Information Exchange

- Sixty percent of African American respondents identified the *Computer* most often as the preferred way to get disability research information.
- *Telephone/Toll Free Information Line* was identified by 58 percent of American Indian respondents compared to 32 percent of White respondents. Only 16 percent of the Hispanic respondents selected this format.
- Eighty percent of the Hispanic respondents indicated *Printed Materials* as the preferred format.

Providing increased levels of culturally and linguistically appropriate information should be the goal for each of the preferred formats reflected in these responses. Since language is inherent in information exchange, it should be carefully matched to intended user groups.

Computer Ownership and Internet Access

- Of those respondents who reported availability of a *Computer at home*, 82 percent were White, eight percent were African American, and five percent were American Indian; in addition, non-Hispanic respondents were much more likely than Hispanic respondents to have a computer at home (89% vs. 5%).
- *Internet access through home computers* was generally high for each of the groups who reported having a computer at home. Seventy-nine percent of White respondents indicated "yes" to having Internet access at home compared to 74 percent of African American and 67 percent of American Indian respondents. Eighty-two percent of Hispanic respondents with a computer at home had Internet access compared to 76 percent of non-Hispanic respondents.
- More Hispanic respondents without a computer at home identified using the Internet at *Independent Living Centers* (ILCs) compared to non-Hispanic respondents without a computer at home (46% vs. 26%).
- More American Indian and African American respondents without a computer at home report using the Internet at ILCs compared to White respondents (38%, 33%, and 25%, respectively).
- *Searching for Information/Research* and *Electronic Mail* (communicating with friends/family) were indicated most frequently as reasons the Internet was used among all groups with and without a computer at home except by African Americans. In addition to *Searching for Information/Research*, African Americans also cited *Locating Disability Organizations* as a frequent reason for Internet use.

The findings related to computer and Internet access are consistent with several other studies on minority groups' computer use and access. The existence of a technology use gap between Whites and minority group members has been widely documented (Casey, Ross, & Warren, 1999; Cultural Access Group, 2001; Goslee, 1998). Additionally, individuals with disabilities tend to be less likely to own computers and when the factors of disability and race are combined, this likelihood further decreases (Kaye, 2000; Wilhelm, 1996).

One promising finding in the *NCDDR Survey 2000* is that Hispanics with disabilities who did not have a computer at home were more likely to use computers and the Internet at ILCs. Goslee (1998) proposes that the availability of computers and network connections in environments where people are comfortable encourages use of such technology. Researchers, in their efforts to disseminate disability-related research, should consider networking with ILCs and other similar community organizations where computers are available and their use encouraged.

Summary

The findings from the *NCDDR Survey 2000* provide information regarding the ways consumers with disabilities who are also members of racial, ethnic, or cultural minority groups find and access disability research information. Key findings may provide researchers with potential areas in which to reexamine research and dissemination efforts and outcomes. These areas include providing accessible computer-based information, identifying relevant research topics for specific groups, using methods designated by different target groups as ways to obtain information, and understanding the availability of computers and the Internet among diverse consumer groups. Findings can be helpful in understanding the complexity of consumers' information needs characteristics. Clearly, no one dissemination strategy works for all

consumers and desires differ according to racial, ethnic, and other affiliations.

For further discussion on disability, diversity, and dissemination, please see *The Research Exchange*, Volume 4, Numbers 1 and 2 (NCDDR, 1999), available online at: **http://www.ncddr.org/du/researchexchange.** Future NCDDR surveys will delve into additional issues with representative consumer-group samples to better inform dissemination practices targeting minorities with disabilities. A copy of the complete *NCDDR Survey 2000* report is available online at: **http://www.ncddr.org/du/products/survey2000.html** and upon request.

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Disability Statistics Center Reports People Need Statistical Information

The Disability Statistics RRTC collaborated with the NCDDR in the 2000 Survey in order to learn about consumers' and stakeholders' need for disability statistics information. At the end of the NCDDR Survey 2000 questionnaire, a series of additional questions were asked that related to disability statistics. These questions were developed by the Disability Statistics Center (DSC) in collaboration with the NCDDR. Responses were sent directly to the DSC for analysis. Following is a brief overview of the initial findings. For more information, contact Alice Wong at the DSC: <alwong1@itsa.ucsf.edu>

The NCDDR collected data regarding the needs and preferences for disability statistics from 1,138 respondents with some connection to the field of disability, including people representing consumer groups and people involved in the provision of health and social services. Nearly 70 percent identified themselves as having a disability. The sample is predominantly female (61 percent) and white (83 percent). However, there are substantial numbers of people of minority racial and ethnic backgrounds. Sixty-three percent described themselves as living in an urban/suburban setting.

Disability statistics are important to those surveyed. Just six to seven percent said they had no interest in disability statistics in response to an array of questions about their needs and preferences for information. Most (70 percent) had a need for disability statistics at least once or twice in a typical month; 9 percent needed statistics daily. Sizable proportions expressed needs for statistics on a variety of sub-populations and with regard to all aspects of social life. However, the greatest needs appear to be with regard to issues of disability and employment, education and government programs/services.

The most popular formats for receiving statistics were information briefs or abstracts and visiting web sites. The data also illustrate that, in addition to national-level statistics, there is considerable interest in obtaining statistical information on disability by city/town (53 percent), county (57 percent), state (75 percent) and region (45 percent). Overall, most respondents rated available statistical information on disability as either just adequate (41 percent) or less than adequate (36 percent).

Additional analyses of these data will explore how some of these indicators of interest in, need for, and satisfaction with disability statistics vary along characteristics that differentiate respondents from one another. For example, we shall examine differences between those identifying themselves as consumers or advocates and those working as providers.

Allen J. LeBlanc, Ph.D., Assistant Director
Disability Statistics RRTC

Who's in the News

NCDDR staff are on the lookout for popular and disability media pieces that present research funded by NIDRR. In this issue, we share news items from ***Computerworld***, the ***Missouri Ruralist***, and ***HR-Today.com***.

Please let us know when an item representing your NIDRR-funded project appears in the media. Call us, 1-800-266-1832 or send an email to the NCDDR <pcastane@sedl.org> and we will review the item for *Who's in the News*. You may also use an online form: **http://www.ncddr.org/forms/submitnews.html**

Computerworld magazine published an online article entitled *Feds Publish Web Access Rules* on December 21, 2000. The Web access standards, which Federal sites must comply with by June 21, 2001, were issued by the Architectural and Transportation Barriers Compliance Board and are "a subset of broader guidelines for Web accessibility published by the World Wide Web Consortium (W3C)." The rules require that federal agency information provided via the Web be easily accessible and usable to individuals with disabilities. For example, if a Web page uses images as navigational aids for sighted users, then text equivalents must be made available to blind users who may use text-to-speech devices.

The article includes a quote from Dr. Gregg C. Vanderheiden, Director of the Trace Research and Development Center at the College of Engineering of the University of Wisconsin at Madison, "All of the things required are good Web design anyway. And what you do to make the things accessible are the things you do to make them usable with mobile technologies." Dr. Vanderheiden edited the Web Accessibility Initiative (WAI) Guidelines. As a member of the Electronic Information Technology Access advisory committee, he collaborated on the development of the Section 508 regulations. Consequently, **Mr. Gary H. Anthes**, features writer with ***Computerworld*** and author of the article, contacted Dr. Vanderheiden for background information on the specifics of the contents of Section 508 of the Rehabilitation Act Amendments of 1998, which were published by the Access Board on December 21, 2000. An online version of the ***Computerworld*** article is available: **http://computerworld.com/cwi/story/0,1199,NAV47_STO55513_NLTw,00.html**

For more information contact The Trace Center at 608-262-6966 or email: **info@trace.wisc.edu**

The January issue of the ***Missouri Ruralist*** featured a cover story entitled *Help for Arthritis*. The story is about the *Farmers and Arthritis* Project of the Missouri Arthritis Rehabilitation Research and Training Center (MARRTC) and highlights how farmers can decrease arthritic-related pain by changing the way they work. Project coordinator, Karen Funkenbusch, points out that arthritis significantly impacts farmers across Missouri, a state with about 110,000 farms. A project study "found that one-third of Missouri farmers said arthritis inhibits at least some activities and that one-third said they reduced their physical labor due to arthritis." Providing education to farmers about the causes and treatments for arthritis is a major focus of the project, which provides free on-the-farm assessments by physical and occupational therapists.

The article includes suggestions from Marian Minor, Ph.D., a Principal Investigator with MARRTC and professor of Health Related Professions and Physical Therapy at the University of Missouri. "Farmers get joint abuse, not exercise," says Minor of the daily activities of farmers. According to Minor, some of the simple ways to minimize joint stress while working on the farm include: wear boots with good supports, create smooth walkways in high-traffic areas, and avoid excessive squatting. She recommends raising work surfaces and keeping things up to minimize bending and squatting and thus decreasing stress on joints.

The article was written by **Steve Fairchild**, field editor of the ***Missouri Ruralist***. The monthly publication has a circulation of about 30,000 to farmers who are actively engaged in production. Mr. Fairchild's ongoing interest in health and safety issues as they relate to farmers led to his contact of the project for further information, states Ms. Funkenbusch. She notes that he wanted to do a "follow-up story on arthritis" for farmers to keep abreast of ways to work while decreasing pain. An online version of the article is available: **http://www.muhealth.org/~arthritis/spotlight/ruralist.html**

For more information about the Farmers and Arthritis Project, contact Karen Funkenbusch, project coordinator, **funkenbuschk@missouri.edu**

The ***Missouri Ruralist*** is one of 36 titles produced by Farm Progress Publications headquartered in Carol Stream, Illinois. For more information contact **Steve Fairchild: sfairchild@farmprogress.com**

The ***HR-Today.com*** Web site posted an online article entitled *Untapped Talent Pool* on July 31, 2000. Highlighted is a study on employment of people with disabilities, conducted by the Program on Employment and Disability at Cornell University. The study found that "of the 800 private sector respondents, some 43 percent cited negative attitudes of supervisors and co-workers toward persons with disabilities, while 22 percent of the 400 federal employers surveyed cited the same problems." Dr. Susanne Bruyère, Principal Investigator of the NIDRR Research and Demonstration Project for the private sector study, was quoted: "Companies must get very specific with their policies. They've got to have it be a part of their mission statement that diversity includes people with disabilities, so that supervisors and recruiters get the message."

In addition, multi-year studies by the Cornell researcher revealed that because of the Americans with Disabilities Act (ADA) of 1990, more than 80 percent of both federal and private employers had made changes to workplaces such as improvement of access and provision of flexible schedules. However, as Dr. Bruyère points out, "the real problem seems to be getting people to accept those with disabilities into the

workforce." She believes that there's a need for more "sensitivity training of supervisors and employees." The survey of the federal sector was funded by the Presidential Task Force on Employment of Adults with Disabilities. The article can be found at **http://www.hr-today.com/main842000.html**

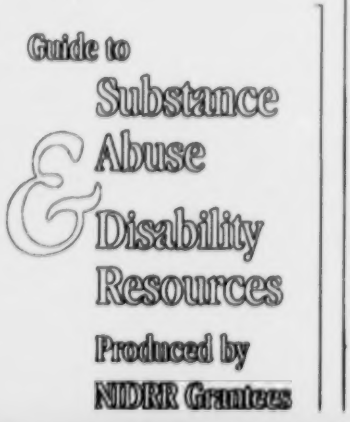
For further information call **Dr. Bruyère** at **607-255-7727** or email: **smb23@cornell.edu**.

The article was written by **Anita Bruzzese**, a Missouri-based freelance writer specializing in workplace issues. Her interest in the ADA study conducted by Cornell surfaced because of the ADA's ten-year anniversary. *HR-Today.com* is a free online magazine for human resources professionals. It is an editorial product sponsored by *jobfind.com* (a New England region job board created by the *Boston Herald*).

The NCDDR and the Rehabilitation Research and Training Center on Drugs and Disability (Wright State University/ New York State University) have updated the

Guide to Substance Abuse and Disability Resources Produced by NIDRR Grantees.

The first edition was highly requested by grantees and many others. With even more resources for researchers, service providers, and people with disabilities, the new ***Guide*** will be available in June, 2001



NIDRR Grantee and Staff Recognition

The NCDDR continues to share the recognition given to NIDRR-funded researchers and their staff. All grantees are encouraged to send this information to the NCDDR for future issues. Email us at <pcastane@sedl.org>, call 1-800-266-1832, or use the online form available on the NCDDR Web site: **http://www.ncddr.org/forms/submitrecog.html**

John Maxson, Training Director of the **Rehabilitation Research and Training Center on Blindness and Low Vision** was presented with the national *RSA Commissioner's Award for 2000* in October. This award recognizes the RRTC's "Placement 2000" training program for "outstanding achievement and distinction in the training of qualified rehabilitation personnel." More than 130 persons completed the RRTC/ American Foundation for the Blind training program at locations ranging from Guam to Canada. For more information, contact **Kelly Schaefer**, Dissemination Specialist, **schaefer@ra.msstate.edu**

Paul Wehman, Ph.D., Principal Investigator for the **Rehabilitation Research and Training Center on Workplace Supports** was recognized in *Remedial and Special Education* (Vol. 21, No. 6) as one of the *top fifty influential persons in special education history*. Dr. Wehman was included for his historic work in supported employment, as well as for changing work opportunities for individuals with disabilities. He was listed with other distinguished leaders such as Helen Keller, Jean Piaget, Alfred Binet, John F. Kennedy, and B. F. Skinner. Both Dr. Wehman and the RRTC on Workplace Supports acknowledge that the work accomplished would not have been possible had it not been for the vision of the National Institute on Disability and Rehabilitation Research (NIDRR) and the U. S. Department of Education's Office of Special Education and Rehabilitation Services (OSERS).

Dr. Wehman is Professor and Chairman of the Division of Rehabilitation Research within the Virginia Commonwealth University (VCU) Department of Physical Medicine and Rehabilitation. He also serves as Co-Investigator of the Model Systems for Individuals with Spinal Cord Injury project at VCU.

For more information, contact **Valerie Brooke**, Associate Director of Training, **vbrooke@saturn.vcu.edu** or **804-828-1851**.

Marian Minor, Ph.D., a Principal Investigator with the **Missouri Arthritis Rehabilitation Research and Training Center (MARRTC)**, was named *Humanitarian of the Year* by the Central Missouri Branch office of the Arthritis Foundation on Oct. 19, 2000. In announcing the honor, Crystal Brady, Director of the Central Missouri Branch office, cited Minor's research efforts on exercise and arthritis and her many years of volunteer efforts with the Arthritis Foundation. Minor's work has included contributions to national Arthritis Foundation articles and brochures on arthritis and exercise.

In addition, Dr. Minor's research on exercise in the treatment of arthritis drew invitations to present at different venues in Europe. On May 4, 2000, she addressed the Swedish Rheumatology Health Professionals conference in Halmstad, Sweden. Minor also presented at the University of Lund and the Karolinska Institute in Sweden. On May 10, 2000, as the keynote speaker, Minor addressed the national meeting of the British Society for Rheumatology in Brighton, U. K. She was also invited to present at the Fifth World Congress on Osteoarthritis held in Barcelona, Spain from October 4 through October 7, 2000. Online versions of the articles are available:

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continued from page 11

http://www.muhealth.org/~arthritis/spotlight/award_minor.html

http://www.muhealth.org/~arthritis/spotlight/mmpresents.html

http://www.muhealth.org/~arthritis/spotlight/113000miner.html

Dr. Minor, a physical therapist, is Associate Professor in the Department of Physical Therapy, School of Health Related Professions at the University of Missouri. She can be contacted at **minorm@health.missouri.edu** or **573-882-1579**.

The work of **Karen Smarr, M. A.**, a researcher with **MARRTC**, was presented at a national news conference on October 31, 2000 during the annual meeting of the American College of Rheumatology and Association of Rheumatology Health Professionals. Smarr's research examined the effects of treating people with rheumatoid arthritis and depression and was among 27 papers presented (selected from more than 2,000 presentations) during national press conferences held at the meeting in Philadelphia. An online version of the article is available:
http://www.muhealth.org/~arthritis/pressrel/smarracr.html

Smarr can be reached at **573-814-6000, ext. 3679** or by email: **smarr.karen@columbia-mo.va.gov**

The Web site of the **Missouri Arthritis RRTC (MARRTC)** has received several awards. The site received the *Hardin MD Clean Bill of Health* award for its excellent Rheumatology, Arthritis and Fibromyalgia site. Presented in the Fall, 2000, this award is based on the connection rate of links (percentage of functional links) on the MARRTC Web site pages. Eric Rumsey of the Hardin Library for the Health Sciences at the University of Iowa reports that "the *Clean Bill of Health* award is given to the 'best of the best' sites that have connection rates of at least 93 percent." See the story on the MARRTC Web site:
http://www.muhealth.org/~arthritis/spotlight/hardinmd.html

MARRTC's Web site was also a winner of the *Medical Award* from Med411 in October, 2000. Established in 1997, Med411 offers a self-contained searchable database of thousands of medical web pages. The award means the MARRTC Web site has been approved and will be added to the Med411 database. The story is on the MARRTC Web site:
http://www.muhealth.org/~arthritis/spotlight/med411.html

For more information on MARRTC items contact **Dianna Borsi O'Brien**, MARRTC Senior Information Specialist, **obriendi@missouri.edu** or **573-882-2914**.

The Links2Go Key Resource award in the Spinal Cord Injuries topic was awarded to two NIDRR-related Web sites. Based on objective analysis of millions of Web pages, Links2Go selects up to 50 of the most representative links as *Key Resources* for each topic. According to Links2Go, the *Key Resource award* is completely objective and less than one page in a thousand will ever be selected for inclusion. The Links2Go index is rebuilt monthly and during this process the system selects the set of *Key Resources* related to each topic. See **http://www.links2go.com/about**

- The **Northwest Regional Spinal Cord Injury System** (located in the University of Washington's Department of Rehabilitation Medicine) received the award in July, 2000. For further information contact **Cynthia Salzman**, Public Information Specialist, **csalzman@u.washington.edu**, or **Diana D. Cardenas, MD**, Principal Investigator, **206-543-8171**.
- **The National Rehabilitation Information Center** (NARIC) was recipient of the award in July, 2000. For more information contact **Mark X. Odum**, Principal Investigator, **modum@kra.com**

How To Contact The National Center for the Dissemination of Disability Research

Call Us
1-800-266-1832 or 512-476-6861 V/TT
8 A.M.–NOON and 1 P.M.–5 P.M. C.T.
Mon.–Fri. (except holidays) or
record a message 24 hr./day

Explore Our Web Site
http://www.ncddr.org/

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Dissemination of Disability Research
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The Research Exchange is available in alternate formats upon request.

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THE Research Exchange

At a Glance

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This newsletter is available in alternate formats upon request.

SOUTHWEST EDUCATIONAL DEVELOPMENT LABORATORY
SEDL
Building Knowledge to Support Learning

NIDRR

Disability Research *for All*

The outcomes of wide-ranging NIDRR-funded research can be applied in many cases to help people with disabilities in their daily lives.

This may require an interpretation of the disability research information, as well as making it available in formats and through channels people use. The NCDDR has pursued survey activities to give NIDRR grantees real data about how consumers with disabilities get and use disability research information. An important finding of the NCDDR Survey 2000 showed that respondents from diverse racial and ethnic groups had differing responses about preferred formats and information sources.

To be mindful of cultural differences in dissemination and utilization assumes that the information to be shared will have value and be useful to the members of different groups. However, the research outcomes may not be applicable if those groups are not represented in the original research sample. A review of the research designs of several NIDRR grantees' proposals that were approved for funding demonstrated little attention to race, ethnicity, and cultural diversity.

Participants in a research study are complex individuals with many differing characteristics. The variables of age, gender, socio-economic status, work status, disability status, geographic location, language, and culture often impact significantly an individual's value system. The challenge in research is to recognize these inherent differences and to try to make sense of the resulting data. While filters may be appropriately applied by the researcher, the impact of an individual's culture and language should not be ignored, nor should representatives from a variety of backgrounds be automatically excluded from a sample.

Just as there are multiple definitions of what constitutes a 'disability,' especially in the current era of a new paradigm and emerging disabilities, cultural value systems are integral parts of an individual's characteristics that can influence the impact of your outreach efforts. This issue of *The Research Exchange* examines the topic of designing and conducting research, as well as the dissemination and utilization of research outcomes, with diverse cultural groups in mind.

racial and ethnic groups, age, gender, socio-economic status, work status, disability status, geographic location, language, and culture

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Disability Research for All, *continued from page 1*

The NCDDR invited several grantees working on projects that focus on diversity in disability research to contribute information about their experiences with research strategies that help them reach diverse audiences. Following is a brief description of the NIDRR grantees' contributions.

Strategies for Reaching Out to Minority Individuals with Disabilities

Fabricio Balcazar is Principal Investigator of a NIDRR-funded project, Developing the Capacity of Minority Communities to Promote the Implementation of the Americans with Disabilities Act (ADA), at the University of Illinois at Chicago. He describes the approach and activities he and his colleagues have developed working in the Chicago area with consumers with disabilities from minority backgrounds. The principles of community psychology, with a focus on empowerment at individual and

A Word from the Director

Cultural Validity

Research literature is beginning to seriously attend to the way in which research designs deal with cultural affiliations within sampling procedures. Indeed, human-intensive research is conducted within a cultural framework that it can either ignore or specifically address.

The way in which cultural validity (Quintana, Troyano, & Taylor, 2001) is achieved through research designs has a tremendous implication for the dissemination and utilization of the resulting research outcomes. In determining appropriate "user groups" for the results of disability research, one must be careful not to assume that all findings are generalizable to all groups. Most researchers in the disability arena structure research designs around specific disability conditions. Additionally, characteristics of age, sex, and race/ethnicity are recorded for each subject/participant. However, the statistical power of these characteristics as represented within the original sample is not consistently considered in developing a dissemination plan for the outcomes of that research. This issue of *The Research Exchange* suggests that characteristics of the original sample should be heavily considered when developing a dissemination plan for the purpose of utilization.

Currently available data suggest real differences between minority persons with disabilities and their non-minority counterparts. For example, Flowers, Edwards and Pusch (1996) find that the vocational rehabilitation services received by minority persons with disabilities result in lower rates of successful competitive employment outcomes when compared to persons with disabilities from non-minority backgrounds. Researchers such as Walker, Akpati, Roberts, Palmer, and Newsome (1986) find that the rate of service delivery to minorities with disabilities may be 33 to 50 percent less than that provided to their non-minority counterparts. Traditional characteristics routinely collected regarding subjects/participants in research activities may not be sufficient to detail the true complexities of cultural diversity exemplified by any individual. Consider, for example, the cultural implications of changing demographics showing that three out of ten Hispanic and Latino Americans are not born in the United States (President's Advisory Committee on Educational Excellence for Hispanic Americans, 1996). Further, Leal (1990) finds that Latinos and Hispanics with disabilities are classified as "ineligible for services" more frequently than their White counterparts.

Clearly, a research design must meet certain perceptions of cultural validity as certainly as it must meet adequate levels of internal, external, and construct validity. It would also follow that findings of a research study should be clear in their implications for specific minority persons with disabilities prior to a decision to promote them for utilization by those very groups. In other words, generalizing to all persons with a designated disability may not be warranted if the research design and sampling was not carefully constructed to ensure sufficient numbers to represent the cultural affiliations of all minority persons with disabilities.

This issue of *The Research Exchange* highlights the relationship between cultural validity of research implementation with appropriate and effective dissemination plans and outcomes. Several NIDRR grantees share their rich experiences and perspectives related to this issue.

John D. Westbrook, Ph.D.
Director, NCDDR

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President's Advisory Commission on Educational Excellence for Hispanic Americans. (1996). *Our nation on the fault line: Hispanic American education*. Washington, DC: White House Initiative on Educational Excellence for Hispanic Americans.

Quintana, S. M., Troyano, N., & Taylor, G. (2001). Cultural validity and inherent challenges in quantitative methods for multicultural research. In J. G. Ponterotto, J. M. Casas, L. A. Suzuki, & C. M. Alexander (Eds.), *Handbook of multicultural counseling* (pp. 604–630). Thousand Oaks, CA: Sage.

Walker, S., Akpati, E., Roberts, V., Palmer, R. & Newsome, M. (1986). Frequency and distribution of disabilities among Blacks: Preliminary findings. In S. Walker, F. Z. Belgrave, A. Banner, & R. W. Nicholls (Eds.), *Equal to the challenge: Perspectives, problems, and strategies in the rehabilitation of the nonwhite disabled* (pp. 51–54).

community levels, form the basis for their actions over the past ten years. Dr. Balcazar presents a number of strategies for maximizing knowledge about your consumer audiences and establishing relationships that will continue for prolonged periods of time.
See page 9.

Reaching out to Minority Farmers with Disabilities

Ari Mwachofi, University of Arkansas, Pine Bluff, describes the NIDRR-funded project Developing a Rehabilitation Service Delivery Model For Minority Farmers with Disabilities. One of the primary problems involved locating and identifying minority farmers with disabilities, and then, motivating them to participate in the project's information-gathering activity. Dr. Mwachofi discusses several strategies the project staff used to find the farmers, including some that were abandoned because they were not successful. She also discusses barriers encountered and strategies used in interviewing participants.
See page 15.

Center for Minority Training and Capacity Building for Disability Research

Irvine Epps, Dean of Continuing Education and Principal Investigator, and Darrell Simmons, Project Coordinator, are the primary staff members for the Center for Minority Training and Capacity Building for Disability Research, funded by NIDRR and based at Texas Southern University. To develop this overview, they discussed Center activities with the NCDDR by telephone and through electronic mail, and shared project materials. The Center was established to support and encourage minority researchers in the area of disability research. Activities include examining the status of minority researchers at majority and minority institutions of higher education; identifying barriers, and addressing ways to overcome those barriers in order to increase the numbers of researchers from minority backgrounds, including those with disabilities.
See page 17.

Designing and Conducting Research with Diverse Consumer Groups: Implications and Considerations

Concepts of culture, race, ethnicity, disability, power and what these mean to disability research and effective outreach by service organizations were introduced in *The Research Exchange*, Volume 4, Numbers 1 and 2 (NCDDR, 1999a, 1999b). A theoretical discussion of the relationships of these concepts was presented as well as discussions of the characteristics of effective "culturally competent" systems or organizations. These concepts are related to issues in conducting research as well as issues in dissemination and utilization. In this issue we discuss some of the challenges that are inherent in conducting research involving representative samples of diverse consumer groups. Researchers across various disciplines continue to agree that conducting research with diverse consumer groups is not a simple, straightforward task and can be daunting (Bryan, 1999; Marshall, 2001; Morrow, Rakhsha, & Castañeda, 2001; Muntaner, Nieto, & O'Campo, 1997; Padilla & Lindholm, 1995; Sue, 1999).

Key, in promoting research agendas that include diverse consumer groups, is the fact that America is a diversified nation and the U. S. Census indicates that this diversification is continuing to increase. Schmitt (2001) contends that "The portrait of America emerging from the 2000 census...is that of a more ethnically and racially diverse country, with suburbs filling with new immigrants and a continuing migration from the Frost Belt to the Sun Belt" (p. 1). U. S. Census (2001) figures indicate that substantial differences in growth rates are evident for some racial and ethnic groups. Table 1 illustrates the growth of the U. S. population by race and Hispanic/Latino status from 1990 to 2000.

Table 1. Total Population by Race and Hispanic/Latino Status

	1990 Census (Number in mil.)	2000 Census (Number in mil.)
Black or African American	30.0	34.7
American Indian and Alaska Native	2.0	2.5
White	199.7	211.5
Native Hawaiian and Other Pacific Islander	0.4	0.4
Asian	6.9	10.2
Hispanic	22.4	35.3

Note: Because individuals could report only one race in 1990 and could report more than one race in 2000, the race data for these years are not directly comparable. Figures reported in Table 1 for 2000 Census are based on "race alone" category. Hispanics may be of any race. Source: U. S. Census Bureau (2001). U. S. statistics in brief—1990 and 2000 census race and Hispanic data.

continued on page 4

Designing and Conducting Research with Diverse Consumer Groups, *continued from page 3*

In addition, Americans with disabilities constitute a segment of the population that is also rich in its diversity of characteristics. In the previous issue of *The Research Exchange* (NCDDR, 1999b) we are reminded that:

> Debates continue concerning how many of us are disabled, however. Depending on the criteria used, estimates vary from a low of about 36.1 million (LaPlante, 1992) to about 54 million (NCD, 1997). No matter how you identify and count Americans with disabilities, however, this segment of the population is also rich in its diversity of characteristics. While this diversity is obvious, it can present some interesting challenges to those conducting research addressing disability issues (p. 2).

Individuals with disabilities from diverse backgrounds (including African Americans, Hispanic Americans, Native Americans, Asian Americans, and Pacific Islanders) are significantly represented in the population of Americans with disabilities. For example, Bradsher (1995) reports from 1991–1992 data that among persons with severe disabilities, ages 15–64, African Americans, American Indians, and Hispanics have the highest rates of disability. U. S. Census Bureau data (1997) indicate an increase in percentages among all racial and ethnic groups of persons with severe disabilities. (See Table 2.)

The literature indicates there is a variety of factors to consider when designing and conducting research that samples people with disabilities from diverse backgrounds. Following are descriptions of some issues related to conducting research with diverse consumer groups.

Table 2. Prevalence of Disability by Race and Hispanic/Latino Status

	Percent with a severe disability 1991–1992	1997
Black or African American		
All ages	12.2	15.7
Ages 15–64 (of above)	12.7	26.8
American Indian and Alaska Native		
All ages	9.8	—
Ages 15–64 (of above)	11.7	—
White		
All ages	9.4	12.2
Ages 15–64 (of above)	7.4	16.0
Asian or Pacific Islander		
All ages	4.9	8.5
Ages 15–64 (of above)	4.5	10.2
Hispanic		
All ages	8.4	9.7
Ages 15–64 (of above)	9.1	16.4

Sources:
Bradsher, J. E. (1995). Disability among racial and ethnic groups. *Disability Abstracts, 10,* 1–4.
U. S. Census Bureau (1997). Americans with disabilities.

Status of minority-related research.

Although some gains have been made in research pertaining to diverse consumer groups, there remains a dearth of this research relative to the research on white, middle class populations. Sue (1999) comments on this lack of research on ethnic minority populations,

> One parsimonious explanation for the state of ethnic minority research is that there are few researchers interested in the topic and that the ethnic field is relatively underdeveloped. In this view, it will take time before culturally appropriate research measures, tools, and methodologies can be established. I do not believe that the notion of underdevelopment can fully explain the disparity in research sophistication and publication rates. Rather, the current practices in psychological science have contributed to the problem...(p. 1071)

Evidence exists that there are relatively few articles across empirical research journals that deal with diverse populations (Kazdin, 1999; Padilla & Lindholm, 1995; Quintana, Troyano, & Taylor, 2001; Stodden, R. A., Hemphill, N. J., Kim-Rupnow W. S., & Sam, A. A., 2000; Sue, 1999; Sue, Bingham, Porché-Burke & Vasquez, 1999). Several reasons have been attributed to the lack of research with ethnic and racial groups: difficulty in obtaining external validity, difficulty in recruiting members of ethnic and racial groups, lack of culturally appropriate validated measures, difficulty in providing linguistically-appropriate methods of data collection, mainstream theories with unknown validity, and "the often controversial nature of ethnic minority research" (Sue, 1999, p. 1074).

Researchers and research organizations can provide answers to significant culturally-related questions through quantitative and qualitative research studies. It may take changes in policy, attitudes, ways of looking at external validity, and more effective outreach to include diverse populations, but as the nation becomes more heterogeneous, it becomes imperative to diversify the research samples to ensure more

appropriate interpretation of the findings for specific groups.

Rogler (1989) makes a plea for culturally sensitive research:

> Research is made culturally sensitive through a continuing and open-ended series of substantive and methodological insertions and adaptations designed to mesh the process of inquiry with the cultural characteristics of the group being studied...The insertions and adaptations span the entire research process, from the pretesting and planning of the study, to the collection of data and translation of instruments, to the instrumentation of measures, and to the analysis and interpretation of the data. Research, therefore, is made culturally sensitive through an incessant, basic, and active preoccupation with the culture of the group being studied throughout the process of research (p. 296).

Sampling should reflect the real population.

To properly generalize the results to the targeted population and replicate the findings of a research study it remains critical to understand the characteristics of the population. Sampling should be carefully planned to create findings to match outreach to targeted groups such as persons with disabilities who are from diverse backgrounds. As part of the research design, the sampling should match the eventual targeted group for whom the findings will be generalized. According to Padilla and Lindholm (1995) there are three major methodological issues in identifying and selecting a sample:

- What are the demographic characteristics of the population?
- Can a random and representative sample be obtained, and how?
- Is the sample adequately described so that a replication can be carried out? (p. 101)

In determining the demographic characteristics of the population, care must be taken not to confound culture, ethnicity and social class. Confounding these characteristics could result, for example, in a comparison between a middle-class white sample and a working-class Hispanic sample, which could produce inaccurate results and misinterpreted findings. Additionally, when research participants from diverse cultural and racial groups are included in the research design, there tends to be an inadequate description of the participants "to the point that one has difficulty ascertaining what 'Hispanic' or 'Asian' means. Is the participant a third-generation or immigrant individual from a working class, middle class, or upper-class background?" (Padilla & Lindholm, 1995, p. 102). The composition of the sample should be clearly and adequately described to help ensure accurate generalizations to the eventual targeted group. Not only do clearly described samples minimize inaccurate interpretations of the results, they also facilitate the replication of studies.

Obtaining samples that represent the target population may sometimes be difficult due to various reasons including, but not limited to, reluctance on the part of potential participants, participants' mistrust of the research process, and cultural and language barriers. Aside from these, however, qualification guidelines set forth by the research team may sometimes create a barrier in obtaining a representative sample. Leslie (2000) notes that when individuals from diverse groups with diverse demographic characteristics are excluded from studies that would be beneficial for them, "the fault lies with the rules for deciding who qualifies for a study–guidelines designed with the best motives but that often weed out the people who would benefit most from the research" (p. 1). Leslie (2000) reports on a research study conducted at The University of California San Francisco by Keith Humphreys and Constance Weisner that examined "how exclusion criteria operate to favor one kind of patient over another." In the article, Humphreys, when asked about the exclusion criteria, noted (as reported by Leslie, 2000) "researchers are motivated by legitimate concerns such as convenience and cost as well as by the desire for a smooth-running, successful study. While their intentions are good, researchers are essentially 'creaming' the patients most likely to succeed, which tend to be well-off whites with less severe psychiatric and alcohol problems...Thus, 'the research gives an unrealistically rosy picture of how well the treatment works'" (p. 1).

In sum, researchers need to take heed of how research samples are selected because the sampling determines to what extent accurate generalizations can be made based on the results. In order for results to have meaning and applicability to members of diverse groups, the sample needs to include adequate representation of individuals from diverse backgrounds. It may take additional effort, but as Humphreys notes (reported by Leslie, 2000), "...to develop treatment programs that work for a larger fraction of the population, researchers will have to take into account the cultural differences of the participants...As a result, scientists may have to work harder to locate and track patients..." (p. 2).

Look beyond homogeneity within diverse groups.

Heterogeneity exists within ethnic and racial groups, and the failure to recognize this fact could essentially skew the results and thereby produce misinterpretation of findings. As an example of this diversity within a group, Mezzich, Ruiz, and Muñoz (1999) report the heterogeneity that is apparent within the Hispanic or Latino group,

> Different nationality groups are manifested in a Hispanic population, with approximately 60% of Mexican origin, 14% of Puerto Rican origin, 7% of Cuban origin, and 19% originating in Central and South America, as well as other Caribbean countries. Also of major importance is their socioeconomic diversity...Diversity is also noticeable with respect to age, gender, employment, and combined demographic variables...(p. 92).

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Sanderson (2001) notes the diversity within the American Indian culture. She reports the latest American Indian statistics reflect "339 federally recognized tribes and 227 federally recognized native entities of Alaska. This count does not include state-recognized tribes and unrecognized tribes who are in the process of appealing to the Bureau of Indian Affairs to become federally recognized as a tribe" (p. 27–28). Likewise, Asians are typically categorized as a single group without consideration of the diversity within this cultural group, which can include Chinese, Korean, Japanese, Hmong, Cambodian, Vietnamese, and others. Bryan (1999) notes,

> Despite the reality that there are multiple cultures for each group, the perception remains that there is a universal culture particularly with respect to racial minority groups. Consequently, a set of characteristics are ascribed to the group and all that belong to the group are generally considered to possess these characteristics. In some instances, these characteristics are positive, but in most cases they represent a less than complimentary opinion of the group. Regardless of whether they are positive or negative, applied universally, they are a gross misrepresentation of a group of people. Because these characteristics often become the benchmark by which individuals within that group are judged they create obstacles of stereotypes and prejudice through which the individual is unable to navigate and set himself free." (p. 43)

Culture-specific information does not apply to all individuals within a racial or ethnic group category. When assumptions are made to this effect, inaccurate conclusions can lead to stereotyping and misinterpreted findings (Correa, 1992; Harry, Rueda & Kalyanpur, 1999; Padilla & Lindholm, 1995; Schaller, Parker & Garcia, 1998).

Research is made culturally sensitive through a continuing and open-ended series of substantive and methodological insertions and adaptations designed to mesh the process of inquiry with the cultural characteristics of the group being studied.

Conclusion and recommendations.

Some of the implications and considerations in designing and conducting research with diverse consumer groups are highlighted here. Recent literature suggests ways to improve and increase outreach to members of diverse cultural groups in order to expand research. Although the literature indicates that we are "not there yet" when it comes to research involving individuals from diverse backgrounds, several recommendations have been put forth on ways to improve this from the planning or design phase to the interpretation of results and dissemination of findings. Following are some suggestions for working toward the inclusion of individuals with disabilities from diverse groups in designing and conducting research.

Padilla and Lindholm (1995) "recommend that, whenever possible, members of the ethnic community be incorporated into the planning and implementation of the research project. This will increase the potential for more relevant research questions and approaches. Further, a more appropriate or bias-free sample may be a more likely outcome when the ethnic community is involved in the research enterprise" (p. 110). Contacting community-based organizations or faith-based institutions that are already involved with the community may be a potentially good way to tap into the most representative sample required for the research. Investing time in developing partnerships with community leaders through community-based activities facilitates this contact. Lack of parity, inclusion, and representation can substantially decrease the motivation for members of diverse backgrounds to participate in research.

Schaller et al. (1998) suggest interviewing practices need to take into consideration several factors, "...an awareness of, and sensitivity to, a family's view of proper social behavior, purpose of the interview, preferred language, issues of time and space, and information-sharing styles needs to be incorporated into interviewing practices" (p. 44). In addition to the development of a more accurate definition for disability, Stodden et al. (2000) advocate the development of "measures that can be used to analyze contextual variables and the dynamic interplay between person and environment, and utilizing more appropriate research methodology in the study of minority communities" (n.p.).

In their discussion on multicultural research and promoting it as "a standard for research in every domain of psychology," Quintana et al. (2001) point out that in addition to the research validities (internal, external, construct, hypothesis, statistical conclusion) that are currently considered in research design and methodologies, a different type of validity should be acknowledged–cultural validity. They note that cultural validity "specifically addresses the cultural aspects of research" (p. 617). They define cultural validity as

> ...the authentic *representation* of the cultural nature of the research in terms of how constructs are operationalized, participants are recruited,

hypotheses are formulated, study procedures are adapted, responses are analyzed, and results are interpreted for a particular cultural group as well as the *usefulness* of the research for its instructional utility in educating readers about the cultural group being investigated, its practical utility in yielding practice as well as theoretical implications about the cultural group, and its service utility in "giving back" to the community in important ways (p. 617).

In their efforts to improve research (and thus relevant information) with members of diverse groups, they recommend ways to improve cultural validity across the phases of research. Some of their recommendations include,

- Apply multicultural theory or indigenous theories to conceptualize research
- Design study to benefit participants directly
- Consult with cultural communities to help formulate relevant research questions and methodology
- Adapt ethnocentric instruments by decontextualizing and recontextualizing for cultural group
- Use interviews or other procedures that may increase cultural congruence of instruments with sample
- Pilot test instruments on sample of target population
- Use multiple measures to represent complexity of cultural phenomena
- Recruit sample that represents target population
- Make recruitment procedures congruent with cultural group
- Investigate moderator effects of cultural variables
- Engage participants in a meaningful way (e.g., ask participants for input in interpretation of data)
- Individualize procedures and reports of results for participants
- Integrate service to community in research as a way of "giving back"
- Represent participants' "voices" authentically when interpreting data (pp. 621–626).

Other research recommendations that the literature suggests to improve the designing and conducting of research with diverse consumer groups include the following:

- Employ a variety of methods to learn about the potential user audiences, including focus groups, surveys, community involvement, input from intermediaries, and ongoing input from potential users themselves.
- Explore a variety of research methodologies, seeking to identify approaches that are most likely to yield accurate, in-depth outcomes related to all target audiences. Consider a blend of qualitative and quantitative approaches.
- Use sampling techniques that provide for adequate representation among all targeted audiences, and address appropriate subpopulations, not merely broad racial or ethnic categories.
- Use a variety of data collection activities that extend beyond traditional mail or telephone surveys. Take care to assure that interview and other questioning variables are culturally appropriate (NCDDR, 1999b, p. 9).

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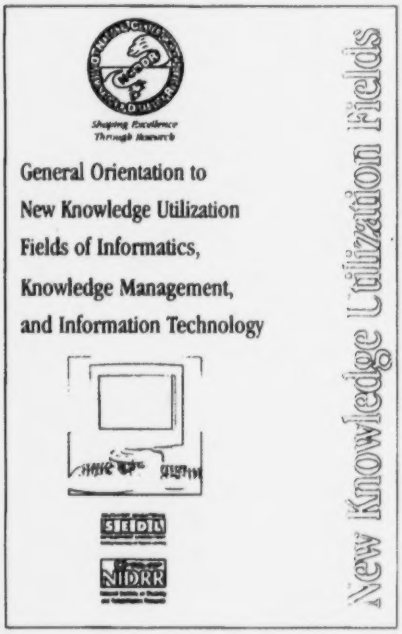

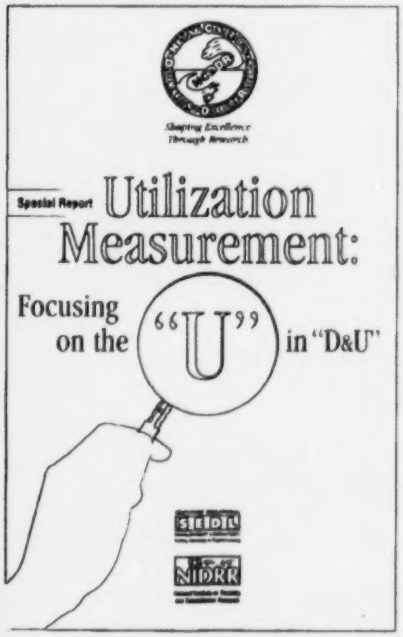

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Strategies for Reaching Out to Minority Individuals with Disabilities

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Reaching out to minority individuals with disabilities is only one aspect of a more broad and complex problem. There is no doubt that the challenges that minority individuals with disabilities face are difficult and complex.

The National Council on Disability in 1993 prepared a report to the President and the Congress on the challenge of meeting the needs of minorities with disabilities (NCD, 1993). This report was prepared on the basis of a national conference with multiple ethnic and disability groups represented. Some of the key findings of the report included the following issues: (1) The problems faced by many minority persons with disabilities are complex and require the coordinated attention of many programs and professionals from multiple disciplines. (2) There is limited research on issues related to minority persons with disabilities, and consequently, there are insufficient data on these populations to offer substantial guidance for policy or service development. (3) Service delivery staff members are not sufficiently trained to work with multicultural populations. (4) There have been insufficient outreach efforts to ensure participation of minority persons with disabilities in many programs. (5) Education should become more available and focus on the abilities of the individuals rather than their limitations. (6) Specific efforts should be made to assist minority individuals with disabilities in the process of advocating and learning to assert their rights through legislation like the ADA or IDEA. (7) There is a need to develop grassroots networks and funded resources to help minority individuals with disabilities become active participants and leaders in their respective communities.

A conclusion that could be derived from a brief review of this list is that reaching out to minority individuals with disabilities is only one aspect of a more broad and complex problem. There is no doubt that the challenges that minority individuals with disabilities face are difficult and complex. Many of these problems are often associated with conditions resulting from poverty. In fact, as Fujiura and Yamaki (1999) found in their review of 1983 through 1996 demographic trends, poverty itself becomes a predictor of disability during childhood.

Both researchers and service providers have long struggled with the process of reaching out to minority individuals with disabilities. Our *Advocacy and Empowerment for Minorities with Disabilities Program* at the University of Illinois at Chicago (UIC) has been attempting to work in collaboration with minority individuals with disabilities — particularly Latinos and African Americans — over the last ten years. We certainly cannot make any claim of having found a magic solution to the outreach dilemma. However, there are a number of approaches derived in part from our field experience and from the principles of community psychology that have been very helpful to us. For those unfamiliar with the field of community psychology, a central goal is to "optimize the well being of communities and individuals with innovative and alternative interventions, designed in collaboration with affected community members and with other related disciplines" (Duffy & Wong, 1996, p. 11). Self-help, community participation and involvement, capacity building, empowerment and community control are central themes of a community psychology approach to research and action.

Our work at UIC revolves around the general theme of consumer empowerment (Fawcett, White, Balcazar et al., 1994), applied at the individual (Balcazar, Keys, & Garate-Serafini, 1995), group (Balcazar, Mathews, Francisco, & Fawcett, 1994) and community levels (Balcazar, Keys, & Suarez-Balcazar, 2001). We conceptualize empowerment as the process by which individuals or groups increase their degree of control over relevant events, desired outcomes or resources in their environment. This process involves both critical reflection and action. We attempt to promote

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empowerment through a participatory action research methodology (PAR). This methodology emphasizes the active participation of community members — in this case minority individuals with disabilities — in all phases of the research and intervention process in order for them to find solutions to their problems and promote their own social transformation (Selener, 1997).

The following is a list of general principles and strategies that we have used to improve our outreach activities to minorities with disabilities. The list is intended as a general guideline to the outreach process.

Staff that is culturally sensitive and aware of the culture's social norms can communicate more effectively with minority individuals.

1. Before you try to reach out to minority populations, make sure you can provide the services they need.

This point should be obvious to service providers, although some agencies with limited resources and staff often find that they are unable to deal with the multiple needs of minorities with disabilities. Service providers and/or researchers should be capable of effectively addressing the needs of the individuals they are trying to serve in order to avoid reinforcing their alienation.

Agencies should make efforts to identify the needs of the target population in order to tailor their services in a most effective way. We utilize a participatory needs assessment methodology called the "Disabled Citizens Concerns Method," developed by researchers at the University of Kansas (Fawcett, Suarez-Balcazar, Wang-Ramos, Seekins, Bradford, & Mathews, 1988; Suarez-Balcazar, Bradford & Fawcett, 1988). This approach has proven useful in helping consumers identify their unmet needs and mobilize them for action (Balcazar, Keys, & Suarez-Balcazar, 2001). Unfortunately, most marginalized populations, particularly African American groups, are overused as research subjects. They are more willing to participate in intervention research that has the potential to bringing some direct benefit to the community. That is why we favor a participatory action research approach. We also make sure to compensate participants for their time spent in data collection activities.

2. Utilize a diverse research team or diverse staff to deliver services to the target population.

Several researchers (e.g., Alston & Bell, 1996) have studied the issue of mistrust, particularly among African Americans, of traditional service delivery agencies [including state vocational rehabilitation (VR) agencies.] This mistrust is incremented if the individuals have to deal with providers who do not seem to share their characteristics or values. That is why it is so important to recruit and support minority staff. They can make consumers feel more welcomed and hopeful that their needs will be met. A frequent limitation in serving the Latino community is the lack of bilingual staff, or having staff that is not familiar with the culture of the target population. Staff that is culturally sensitive and aware of the culture's social norms can communicate more effectively with minority individuals.

3. Build personal relationships with members of the target community.

We encourage team members to get to know community members and establish personal relationships with them in order to develop a better understanding of their culture and values. It is very important to develop personal relationships with the gatekeepers or leaders of the community to seek their input They can have a great deal of influence and their opinions are highly respected by other members of the community. They can be of great help, by introducing you to other community members, facilitating entry or outreach, describing the value of your work to others, and supporting you when you need assistance

4. Become a part of the local network.

This is a common practice for service providers, who often organize in local associations, in order to coordinate services and referrals more effectively. Researchers usually do not get involved in such activities. Over the years, our program has become a part of the local network of agencies serving Latinos with disabilities in Chicago. We have regular contacts with representatives from several agencies and have developed a reputation that facilitates access and mutual support. We have prepared several research proposals in collaboration with those agencies. This collaboration has contributed to the relationship building process. We are often seen as a resource to the agencies' mission.

5. Build consumers' strengths.

An important consequence of focusing on the strengths of individuals with disabilities is that they start to break the dependency that our service delivery system often reinforces. Letting consumers realize that they have to take an active role to address their own problems — as opposed to waiting for the professional to do it — is a critical step in any effective rehabilitation process (Balcazar & Keys, 1994). However, professionals often have difficulties recognizing the capacity of the individuals to help themselves. This is in part a legacy of the medical model and of the arrogance of our professional effectiveness mentality. How often do we hear ourselves whispering, "if only they would do what I tell them to do, things would get better?" This thought reflects our disbelief in the people's capacity to become effectively involved. It helps to consider that the person who experiences the problem knows what the problem is, is familiar with the conditions that maintain it, and has some ideas about ways to solve it. On the other hand, one could ask if that is the case, then why are people still experiencing problems? The reason is that people who are marginalized have little confidence in their own capabilities and people with disabilities in particular are left to focus on their limitations and not on their strengths. Traditional service delivery systems reinforce this perception.

Community psychologists believe in the strengths of the individual. We assume that by reinforcing strengths, competencies improve. Personal competency in turn reflects a sense of mastery and of control over the surrounding environment. This is a chain of positive events that we at the UIC program have often initiated, particularly in the context of minority youth with disabilities, by utilizing skill development and mentoring support to help youth succeed in attaining their personal goals (Balcazar, Fawcett, & Seekins 1991).

6. Be persistent and do not let consumers go when they fail to comply.

As a group, minority individuals with disabilities face multiple challenges that make compliance with traditional service plans difficult. Not surprisingly, they are often terminated from services. It is understandable that service organizations need to have clear policies to determine service eligibility. However, a degree of understanding and flexibility is often necessary to accommodate individuals who have a history of rejection, like some minorities with disabilities do. My staff has been left waiting a number of times, yet each time we follow up and try again. Some participants are startled by our behavior, to the point of asking, "why are you doing this? Why are you so interested?" Once they realize that we really care about what is happening to them and that we are there to help them, things improve. Of course, as research participants, they have the right to refuse treatment. However, we let them know early on, that we are willing to give them many opportunities to succeed in the process of attaining their transition goals.

7. Be willing to listen.

If we want to reach out, we should be able and willing to listen. This is not a trivial point. In effect it is critical, because demonstrating a genuine and sincere concern toward the individual we are trying to reach is key for his/her acceptance and willingness to trust and collaborate. Personal relationships are built on trust. This requires good communication. As professionals, we are often used to telling people around us what to do or not to do. This is one-way communication. In order to build the kind of relationships required for successful outreach and dissemination efforts, we have to be willing to listen and learn from the people in the community. If we show we are willing to listen to them, then they will in turn be willing to listen to us. It is a reciprocal process of communication that benefits all.

8. Utilize members of the target community in outreach efforts.

Some agencies employ members of the target community as paraprofessionals, responsible for outreach and follow up support. This is a well-known community organizing strategy. The leaders and other gatekeepers from the community are a great source of access. In some cases researchers can hire community volunteers to help distribute information to other community members. This strategy is often very effective, particularly if the researcher already has a good reputation in the community. We have often used paid and trained community volunteers to collect needs assessment surveys in the community. They can become excellent research collaborators and develop recognition and increased visibility in the community.

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9. Meet people where they are instead of waiting for them to come to you.

We have tried many strategies to get people to come to meetings. Probably the most effective one was a community organizing effort within the local Latino community, which met once a month in a central accessible location. We provided babysitting services and lunch, as well as reimbursement for transportation costs. We had a regularly scheduled meeting time and date, and people had activities and responsibilities to report every month. They were engaged and invested in the process. In other projects, for instance in inner city schools, we have had the usual difficulties of getting parents to show up to a planned meeting. They have jobs at odd hours; they may have transportation difficulties, baby-sitting problems, etc. These problems are common.

What we have chosen to do is to send case managers to meet the youth and their families in their own homes. During such visits, case managers are instructed to provide as much information as possible about the project and the issues facing the particular student. The case managers eventually develop good relationships with the parents, who then become more willing to participate in planned activities. Many parents eventually start calling the case managers to ask for help or advice. When this happens, we know we have gained their trust. We know that parents play a critical role in supporting or sabotaging the transition process of their son or daughter, so we seek their active involvement in the process.

10. Utilize multiple channels of communication to disseminate information in the target community.

We have learned not to rely on a single channel of communication, hoping that people will get our message. We utilize multiple channels. Word of mouth, phone calls, mailings, pamphlets, posted announcements, and even newspapers and radio announcements are used sometimes in order to reach the desired target audience. The process is more difficult when the target community is not easily identifiable or located in a specific target area. Another outreach strategy is to rely on multiple organizational mailing lists — from multiple service providers — in order to distribute information. This is another reason to maintain an active network of collaboration with local social service agencies.

11. Volunteer to help.

You build good will by increasing your visibility in the target community. One of the best ways to do this is by volunteering to help. There are multiple avenues to do this. I encourage my case managers in the local high schools to volunteer to help whenever possible. Teachers and administrators really appreciate that, and it strengthens the collaboration. It is another way to show that we care. We do the same regularly with other community organizations in our research partnerships. People come to expect reciprocity as a demonstration of our commitment to the community and its well-being.

Conclusion

Reaching out to minority individuals with disabilities should be part of a comprehensive service or intervention research program that ultimately attempts to improve their quality of life. This effort should be conducted as a partnership, with jointly determined goals and objectives, roles and responsibilities. Minorities with disabilities are tired of being "studied." They want allies who can support their struggle for a better quality of life and social justice.

These partnerships are much more than just attempts at data collection. To community members, this could mean access to resources, information and opportunities that they otherwise lack. To researchers and service providers this is an opportunity to develop, implement and evaluate innovative programs and interventions designed to have an impact in people's lives. There are many challenges that minority individuals with disabilities need to overcome. We can be part of the problem or part of the solution. We have a choice.

Author Notes

Special thanks to Yolanda Suarez-Balcazar for her useful feedback in the preparation of this manuscript.
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Lift Every Voice

In the previous article, Dr. Fabricio Balcazar of the University of Illinois at Chicago discusses key issues presented in the National Council on Disability's (NCD) 1993 report, *Meeting the unique needs of minorities with disabilities: Report to the President and the Congress*. The report was developed following a conference held in 1992.

A new report, *Lift Every Voice: Modernizing Disability Policies and Programs to Serve a Diverse Nation*, was issued by NCD in December, 1999, following a public hearing held in San Francisco in 1998. People with disabilities from diverse cultural backgrounds spoke about their experiences at the hearing. Most of the findings and recommendations from the 1993 NCD report continued to reflect the situation for minority individuals with disabilities in 1999.

A number of barriers to full participation of people with disabilities from minority backgrounds were identified in *Lift Every Voice*, along with recommendations for improvement. Some of the recommendations relate to NIDRR's research community. The following highlights from the report include specific elements relevant to NIDRR research.

Resources

People from minority groups may not take full advantage of the laws, services, and programs that are in place to help them. Culturally appropriate information should be made available to inform people of their rights.

Employment

The report recommended that the vocational rehabilitation (VR) system provide job training and placement services that are culturally appropriate. Improved access to childcare is also needed to help erase the barriers to employment.

Public Accommodations

Most federal laws pertaining to disability, with the exception of the Individuals with Disabilities Education Act (IDEA), do not specifically address cultural and linguistic needs and differences. In addition, the large number of agencies that deal with public accommodations actually creates an information barrier. The report suggests a multiagency approach would better meet consumers' needs.

Transportation

The report describes the need to investigate local compliance with transportation requirements, and the need for increased funds for training and awareness to improve transportation access for people with disabilities from minority backgrounds.

Culturally Competent Service Delivery

Limited minority representation among disability service providers decreases the results that are appropriately applied and available to minorities with disabilities. Recommendations include providing training incentives to encourage minority individuals, particularly those with disabilities, to enter fields such as vocational rehabilitation, special education, independent living, and related services. Language and culture may not be considered in service delivery.

The report recommended that NIDRR fund a longitudinal study on participation of culturally diverse professionals in the rehabilitation system. In addition, NIDRR should fund research on such factors as rehabilitation outcomes and educational outcomes as a function of counselor/teacher ethnicity, gender, disability, education, and professional competency (NCD, 1999, p. 12).

Another recommendation was that NIDRR should require its research and training centers with emphasis on minority populations to develop and test guides describing the services provided by independent living centers that model the use of appropriate cultural and linguistic terminology for diverse populations. The report further recommends that the Rehabilitation Services Administration (RSA) should require centers for independent living (CILs) and Statewide Independent Living Councils (SILCs) to use the guides to improve their outreach and service delivery to diverse populations (NCD, 1999, p. 16).

Citizenship

The report identifies a need for waivers for reasons related to disabilities. Some current requirements effectively prohibit many immigrants with disabilities from becoming citizens.

Demographic Data

Recent population shifts point to the reality that more people with disabilities from minority backgrounds are currently and can be expected to be in need of VR and other services in the future. The report recommends that the Census Bureau and the Bureau of Labor Statistics, working with NIDRR and the National Center for Health Statistics, should develop alternative methods for tracking the prevalence of disability within racial/ethnic minority communities at the national, state, and local levels (NCD, 1999, p. 26). In addition, the report suggests that NIDRR should fund nationwide studies that explore the prevalence and experience of disability within different ethnic groups in a particular cultural community (NCD, 1999, p. 114).

Source: National Council on Disability. (1999). *Lift every voice: Modernizing disability program to serve a diverse nation*. Washington, D.C.: Author. Available online: **http://www.ncd.gov/newsroom/publications/lift_report.html** Also Available in PDF format in English, Spanish, and Chinese. **http://www.ncd.gov/newsroom/publications/99publications.html**

Reaching out to Minority Farmers with Disabilities

Ari K. Mwachofi, Ph.D,
Principal Investigator

Developing a Rehabilitation Service Delivery Model for Minority Farmers with Disabilities

University of Arkansas, Pine Bluff

Project Background

The purpose of this project, *Developing a Rehabilitation Service Delivery Model for Minority Farmers with Disabilities*, is to build an effective, participatory and dynamic model of service delivery to minority farmers with disabilities. Such a model requires a thorough understanding of the population's needs, perceptions, disabilities and the most effective methods of reaching and communicating with them. Therefore, model building was preceded by data collection and analysis. The need for this information and for an effective model of service provision is supported by several factors:

- the National Safety Council ranks farming as one of the most hazardous occupations with high rates of injury and disabilities at high economic costs;
- very little is known about minority farmers with disabilities;
- minority populations tend to have higher disability rates than do majority populations;
- minority populations get proportionately fewer rehabilitation services than do other populations;
- minority farm operations are disappearing at an alarming rate in the nation and especially so in the Mississippi Delta states;
- farmers reside in rural areas where it is difficult to provide rehabilitation services.

Since the purpose of the project is to develop a model of effective service delivery to minority farmers with disabilities, the first step the project had to take was to identify these farmers. Nobody has any comprehensive lists of minority farmers let alone lists of minority farmers with disabilities. Even agencies that serve farmers do not have comprehensive lists. For the most part, they have lists of farmers whom they serve. If these lists were used, it would mean that the project would be missing out the farmers who are under-served, thus defeating the purpose of the project. In order to identify these farmers, their needs status and location, the project had to search for the farmers. It has truly been like searching for a needle in a haystack! The search was conducted as follows:

Identify the counties where minority farmers are located and focus search/survey efforts in these counties

Since it is impossible for the project to cover all counties with minority farmers in the three states (Arkansas, Louisiana, Mississippi) the project identified counties with at least 10 minority farmers. Identification of these counties was based on the 1997 Census of Agriculture Data. The project found 31 counties in Arkansas, 42 counties in Louisiana and 65 counties in Mississippi with at least 10 minority farmers. These are the counties of focus where the project is surveying farmers. This survey includes both majority and minority farmers.

Develop and test a farmer survey instrument

A two-part survey instrument was developed: the first part had questions that would help evaluate the farmer's health status and the second part would be used to evaluate the farmer's economic status. The survey instrument was tested on farmers. Their responses and feedback from the interviewers were used refine the survey instrument for redundancies, question direction/focus and comprehensiveness of needed information for model-building. The project plans to compile 500 farmer interviews. The project had completed 300 interviews as of June, 2001.

Training interviewers

The project trained farmers, extension agents and retired people with farm-related backgrounds to conduct the surveys. The interviewers were familiarized with the project objectives and with the questionnaire so that they could answer any questions raised by the farmers during the interviews.

Survey methods

The methods used are:

- one-on-one interviews
- small group sessions with 5 to 10 people
- meetings in large groups
- mail (mailing was abandoned for being ineffective)
- word-of-mouth (having farmers identify other farmers — their neighbors and friends). The word-of-mouth method has been very helpful, especially in identifying those who had to quit farming due to disabilities and for arranging small group sessions with farmers

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Reaching Out to Minority Farmers with Disabilities, *continued from page 15*

- farmers' organizations such as cooperatives and civil organizations (example: the Black Farmers and Agriculturalists Association) allowed the project access to their membership through their general meetings and through small meetings with their members;
- making presentations at farmers' meetings and conferences, and soliciting farmer participation and questionnaire completion;
- presentations about the project in rural churches or through contacting pastors in rural churches.

Project Challenges

Gaining trust of the farmers

This is difficult and yet necessary because of the personal nature of the survey questions. Farmers have very little trust for government or government-related organizations or people from such organizations. Consequently, the project has had to spend a great deal of time talking to farmers about the purpose of the project in order to gain their trust and to get them to open up and to answer survey questions.

Farmers hate paperwork

It is very difficult to get them to respond to a survey questionnaire. Some of them have genuine difficulty with reading and writing — in those cases the project staff had to help with reading the questions and writing their responses.

Bad weather resulting in a loss of a window of opportunity

Serious ice storms hit Arkansas in December and January leading to loss of power, water, and telephone service and even deaths. This situation resulted in time lost in those two months. Those are the months when farmers are not busy in the field and would have been more responsive to surveys. As a result we are conducting surveys when farmers are busy in the field and answering survey questionnaires in the last thing they want to do. They have no time for that! They are in a hurry to meet their seasonal obligations in order to survive! Project staff have learned a hard practical lesson about the weather and the chokehold it has on the farmer–and therefore on the project!

Some interesting observations

The project has spent a great deal of time listening to farmers at meetings and small gatherings. The project has gathered a great deal of insight from the farmers about their perceptions, relationship to the land and service needs. For example, one African-American farmer described land as having been very cruel to black people. He explained how land was the reason for their enslavement and how at the end of slavery they were thrown into a worse form of servitude in the form of sharecropping. He went on to explain how they have suffered and continue to suffer discrimination in agricultural policy applications and administration.

Some farmers who had obvious disabilities did not describe themselves as having a disability. For example, at one gathering, there was a black farmer who has lost most of his hearing in his right ear, was wearing pressure clothing due to severe burns on his upper body, and had lost two fingers from his right hand! In spite all this and living in constant pain from the burns, he explained that he had no disability! He had never received any services in relation to his physical condition! Note that he runs a successful hardware business. What spirit!

Service provider surveys

In order to get a clearer view of service delivery, the project is also interviewing service providers who work directly with farmers such as: cooperative extension agents, Farm Service agents (FSA), National Resource Conservation Service agents (NRCS) and state rehabilitation counselors. This was much easier than interviewing farmers. Lists of the agents were provided by the agencies and were used to mail the surveys to the agents. The agencies have been very supportive and have actually written letters of support for the project and have urged their agents to respond to the survey. The service providers were asked about their workload, attitudes, and experiences in providing services to farmers, including minority farmers with disabilities. They were also asked to identify obstacles they encountered in their efforts to provide such services. The project completed the projected 200 service provider surveys at the end of May, 2001.

Future Activities

Once the interviews are completed, the data collected will be tested against census data to find out if the project sample is representative of farmers in the selected counties. If so the project will test hypotheses about disability and service provision rates between minority and majority farmers in the selected counties.

The data from the farmers and service providers will be used to create a model of effective service delivery to minority farmers with disabilities. Initial observations suggest that more collaboration among service providers could result in more effective service provision to the farmers.

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Center for Minority Training and Capacity Building for Disability Research

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The *Center for Minority Training and Capacity Building for Disability Research* addresses the education, training, and preparation of researchers from minority backgrounds and institutions in disability research, in collaboration with other minority, majority, and tribal institutions. The project includes a multifaceted approach to the assessment of current barriers experienced by minority researchers, including those with disabilities and those funded by NIDRR. Project activities include institutional capacity building for minority institutions to conduct disability research; training minority and majority researchers; and dissemination of information, communications, and publications to enhance the capacity of researchers to compete for future research funds.

The Center held several focus groups at conferences around the country attended by researchers, including minority researchers. Participants were asked to identify barriers that minority researchers face (such as limited access to funding sources, lack of familiarity with some funding agencies such as NIDRR and RSA, limited administrative support, and overwhelming teaching duties, among others). Data from the focus groups were used to develop an Institutional Assessment Survey.

The survey was developed to learn the perspective and opinions of both majority and minority researchers about their institutions' research capabilities and facilities. In addition to general information about the size, budget, and focus of the institution, the survey asked about proposal development processes and support, financial accounting and reporting principles, human subjects, grant and contract management, intellectual property, and research ethics. The survey was distributed to 120 minority researchers from diverse backgrounds — Latino, American Indian, African American, and Asian American. Project staff identified researchers by contacting several known minority researchers and asking for other names. Majority researchers also completed the survey for comparison purposes.

The survey will provide data to formally document the effect of the barriers identified. In addition, through comparison with majority researcher experiences, the Center hopes to determine if some or all of the barriers are limited by the impact of culture, or if other factors such as size of the institution have a similar impact regardless of cultural factors.

Another Center activity will be the pairing of minority researchers, or potential researchers, with majority researcher mentors who can help navigate and explore research possibilities and processes. Increasing the disability research focus of minority institutions and expanding the pool of minority researchers will impact one barrier to research involving individuals from minority backgrounds. Although researchers and service providers do not necessarily have to be members of the same group as the research participants, they must have an understanding of the context of the participants' cultural framework.

Through the survey and other activities the Center for Minority Training and Capacity Building for Disability Research expects to raise awareness of the importance and impact of cultural differences in research; to identify existing barriers to the participation of minority researchers, especially those with disabilities; and to suggest ways to overcome the barriers in order to increase the number of minority researchers in the area of disability research.

Increasing the disability research focus of minority institutions and expanding the pool of minority researchers will impact one barrier to research involving individuals from minority backgrounds.

For further information

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Who's in the News

NCDDR staff are on the lookout for popular and disability media pieces that present research funded by NIDRR. In this issue, we share news items from the **South China Morning Post, National Public Radio's Public Interest, *Computerworld*,** and **Kiosks.Org.**

Please let us know when an item representing your NIDRR-funded project appears in the media. Call us, 1-800-266-1832 or send email to <pcastane@sedl.org> and we will review the item for *Who's in the News*. You may also use an online form: **http://www.ncddr.org/forms/submitnews.html**

The South China Morning Post's ***SCMP.com*** Web site posted an online article entitled *Plea for Web Continuity* on May 1, 2001. The article focuses on "the importance of technical standards that will help preserve current online data and content over the course of time," a topic that Mr. Tim Berners-Lee, inventor of the World Wide Web and Principal Investigator of the NIDRR-funded **Web Accessibility Initiative — Phase II**, planned to speak about during his keynote address at the Tenth International World Wide Web Conference (WWW10). Organized by the International World Wide Web Conference Committee (IW3C2), the annual conference was held May 1–5, 2001 in Hong Kong. The latest developments in Web technology, as well as the issues and challenges facing the Web community, were some of the topics discussed at the conference.

In the article, Mr. Berners-Lee, Director of the World Wide Web Consortium (W3C) at the Massachusetts Institute of Technology, is quoted on several issues ranging from inaccessible sites to the social impact of the Web On the topic of Web information continuity, he says, "It is a question of organizations really committing to being responsible…To have some persistence of that [data] is important for lots of different reasons."

The article was written by **Lydia Zajc,** Senior Technology Writer for the South China Morning Post. The ***SCMP.com*** Website is owned and operated by the South China Morning Post–Hong Kong's leading English newspaper. Upon learning of Mr. Berners-Lee's visit to Hong Kong for the WWW10 Conference, Ms. Zajc contacted him to inquire about the content of his conference speech. The article's topic choice stemmed from her interview with Mr. Berners-Lee, "During our chat I asked him something like 'what is the most crucial issue that is being ignored today'? His answer was Web continuity." The online article is available for purchase in the ***SCMP.com*** Archives.

For further information contact Janet Daly, W3C Head of Communications at 617-253-5884 or e mail: **w3t-pr@w3.org**

A 60-minute segment on the topic of *Technology for the Disabled* aired on ***National Public Radio's Public Interest***, a call in/talk show, on April 10, 2001. Among the participants was Dr. Gregg Vanderheiden, Director and Principal Investigator of the RERC on Information Technology Access and the RERC on Access to Telecommunications at the Trace Center, University of Wisconsin-Madison. Other panelists included representatives from the Presidential Task Force on Employment of Adults With Disabilities and the Technical and Information Services at the U. S. Access Board.

Guest host **Maimouna Mills** along with the panel of guests talked about the latest inventions in technology and the "breakthrough research that is enabling people with disabilities to storm unimpeded into the 21st century." Topics discussed included assistive technology (both high and low tech) products that enhance the quality of life for people with disabilities, inaccessible technology, computer use among people with disabilities, and Section 508 guidelines.

Vanderheiden pointed out that aside from identifying products for a wide range of disabilities, making them marketable and useful can be challenging. He referred to the sometimes inaccessible nature of e-mail, "…when it is done right…it is probably one of the most cross-disability accessible mediums there are…what's scary is that increasingly we are getting e-mail that is showing up in graphic form, either as html, which means that it shows up like a web page or it is showing up using other technologies. As this happens, people who are blind and people who have various disabilities…are beginning to find that e-mail which used to be the thing that was accessible to everybody becoming inaccessible."

Produced by WAMU in Washington, DC, ***Public Interest's*** call-in radio show tackles politics, science, popular culture, social issues, and more. A RealAudio version of the April 10, 2001 broadcast is available at **http://www.wamu.org/ram/2001/p2010410.ram**

Two online articles entitled *Keep the Disabled in Mind When Building Systems* and *Making IT Accessible* were published in ***Computerworld*** magazine on April 30, 2001 and on May 28, 2001 respectively. The access to technology for people with disabilities is the key focus of the articles.

Dr. Gregg C. Vanderheiden is quoted in both articles. "People just don't think about this stuff," says Dr. Vanderheiden on making IT accessible to people with disabilities. He points out that workers with disabilities are much more prevalent in the workforce than what is believed, increased productivity by all employees (not just employees with disabilities) is the outcome when "assistive technology" is put into place, accessibility issues are given minimal attention by information technology designers, and lastly, minimal costs are involved in making information technology more accessible. In addition to paying attention to the workplace, information technology designers should strive to make their Web sites usable and accessible to everyone because "there are customers and business partners who'll click elsewhere if your site isn't easy to use." Vanderheiden stresses that the aging population must also be taken into account in the accessibility of information technology, "The aging of the general population and the increasing complexity of IT are on a collision course that could leave more people unable to use IT effectively."

The articles were written by **Mr. Gary H. Anthes**, Editor at Large with ***Computerworld***. Mr. Anthes' ongoing interest in IT accessibility led to his contact of Dr. Vanderheiden for further information on the topic. Online versions of the articles are available at **http://www.computerworld.com/cwi/story/0,1199,NAV47_STO60006,00.html**

http://www.computerworld.com/cwi/story/0,1199,NAV47_STO60856,00.html

Kiosks.Org posted an online article entitled *Kiosks and Accessibility* on May 10, 2001. **Chris Law**, a human factors engineer in the field of disability and technology at the Trace Research and Development Center at the University of Wisconsin-Madison, was asked by ***KIOSK Magazine*** and ***Kiosks.Org*** to "use his experience with kiosks and the disabled to address kiosks and accessibility."

In the article, Mr. Law emphasizes that accessibility is important considering that recent "Census figures show that more than one-third of the population will acquire some type of disability by the time they reach retirement age — and the percentage goes up steadily after that." Additionally, kiosk manufacturers should be aware that producing kiosks that are easy to use by both individuals with and without disabilities is the "key to incorporate accessible design solutions." A series of integrated techniques developed by the Trace Research and Development Center to promote "access across a wide range of disabilities with relatively few techniques" are shared. Mr. Law also shares several informational links including links for design process and accessibility regulations at the conclusion of his article.

The contact from ***KIOSK Magazine*** was the result of active marketing by the Trace Center. At the KioskCom Conference in Orlando, FL on April 23, 2001, Mr. Law made press contacts, encouraged future contacts, and distributed information concerning the Trace Center's work on kiosks.

The online version of the article is available at **http://www.kiosks.org/articles/pr051001b.html**

For more information on the Trace Research and Development Center items, contact the Trace Center at 608-262-6966 or email: **info@trace.wisc.edu**

NIDRR Grantee and Staff Recognition

The NCDDR continues to share the recognition given to NIDRR-funded researchers and their staff. All grantees are encouraged to send this information to the NCDDR for future issues. Email us at <pcastane@sedl.org>, call 1-800-266-1832, or use the online form available on the NCDDR Web site: **http://www.ncddr.org/forms/submitrecog.html**

The **Southeast Disability and Business Technical Assistance Center (SE DBTAC)** was recognized by the Georgia Committee on Employment of People with Disabilities for the personal work of staff in cosponsoring and helping to organize the *Carl Anthony Cunningham Youth Leadership Forum*. The award was presented at the *Youth Leadership Forum* Appreciation Luncheon on September 25, 2000 in Atlanta. **SE DBTAC** staff received a plaque with the following inscription: "Acknowledgement of Appreciation for Generous Support as a Cosponsor of the Carl Anthony Cunningham Youth Leadership Forum 2000.. this was not 'financial' support, but rather for providing leadership, technical assistance, cooperation, and information to the committee and participants."

The *Youth Leadership Forum* was named in memory of Carl Anthony Cunningham, Chairperson of the Georgia Council on Developmental Disabilities prior to his death in June 1999. Mr. Cunningham believed that "we should help facilitate the development of leaders and persons with disabilities and their families who will carry out the mantle of leadership throughout all aspects of society, thereby making societal leaders who have disabilities commonplace."

For more information on the award or the *Carl Anthony Cunningham Youth Leadership Forum*, please contact **Pamela Williamson,** Assistant Director **pam@crtsun.crt.gatech.edu** or **Shelley Kaplan,** Project Director **se-dbtac@mindspring.com**

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NIDRR Grantee and Staff Recognition, *continued from page 19*

Allen Heinemann, Principal Investigator of the **Advanced Rehabilitation Research Training Project in Rehabilitation Services Research** project and Co-PI of an **RRTC on Stroke Rehabilitation** project (Rehabilitation Institute of Chicago), was honored by the Rehabilitation Psychology Division of the American Psychological Association at the 108th Annual APA Convention (August 4–8, 2000 in Washington, DC). Dr. Heinemann received the 2000 *Roger Barker Distinguished Career Award* "in recognition of his outstanding lifetime contributions to the science of rehabilitation psychology." The *Distinguished Career Award* was named in honor of Roger Barker, a psychologist who helped to establish the influence of the environment on behavior.

The Rehabilitation Institute of Chicago (RIC) was honored with the visit of a group of rehabilitation dignitaries from the People's Republic of China on September 6, 2000. Led by **Dr. Allen Heinemann**, Associate Director of Research, the group visited various clinics and inpatient programs, and heard presentations by Deborah Crown and Robert Treweiller from RIC's vocational rehabilitation services. Among the visiting dignitaries were Dahong Zhou, M.D, professor and chairman of Rehabilitation Medicine at Sun Yat-Sen University of Medical Sciences; Song Zhuoping, Secretary General of the Coordination Committee of the Disabled Affairs, Guangzhou Municipal Government and Director General of the Guangzhou Disabled Persons' Federation; and Mr. Root, Vice Secretary General of the Guangzhou Municipal Government. The group was organized by Professor Chow Lam of the Illinois Institute of Technology, who also led a group of rehabilitation experts to China in June of 2000 for a week-long workshop at Sun Yat-Sen University of Medical Sciences in Guangzhou, China. Dr. Heinemann participated in that workshop and presented lectures on psychosocial and health services research topics.

For additional information, please contact Dr. Allen Heinemann: **a-heinemann@northwestern.edu**

COMING SOON

Outreach to Diverse Groups: *A Primer*

This document focuses on understanding and addressing the needs of individuals with disabilities who are from diverse ethnic and racial groups. Concepts such as culture, language, the heterogeneity within groups, and other factors that impact the outreach and research with diverse groups will be discussed. A case study of effective outreach and research with American Indians with disabilities will be presented.

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SOUTHWEST EDUCATIONAL DEVELOPMENT LABORATORY
Building Knowledge to Support Learning

NIDRR

New Emphasis on Accessibility for the World Wide Web

Over 250 of NIDRR's grantees funded for FY 2000–2001 (approximately 75 percent of grantees) have sites on the Web. These include unique sites operated by the NIDRR-funded project, or specific pages within an organizations' site that are devoted to the NIDRR project. Among the grantees with Web sites, about 25 percent describe Web site or Internet activities in their project abstract. Perhaps because Web-based resources were not a part of many original funding application priorities, the majority of NIDRR-funded projects that have Web sites do not mention them in their project abstracts.

Web-based content should be presented in a way that allows different users with a variety of computers and assistive devices to maximally and equally benefit from the information.

Whether or not the Web site was established in response to a specific priority, NIDRR grantees' Web sites serve as models for both content and accessibility for people with disabilities. Useful and informative content is most critical for a Web site to be effective. Web-based content should be presented in a way that allows different users with a variety of computers and assistive devices to maximally and equally benefit from the information. Ideally, Web sites will be developed with input from content experts and Web development staff who are experienced in the implementation of design features that enhance accessibility, and this will make useful information available to all potential Web site visitors.

Accessibility is an important part of Web site usability. Accessibility features can facilitate usability for Web visitors with disabilities as well as users who may have older, slower computers or slow connections to the Internet. Factors related to usability include:

- satisfaction of users,
- facilitation of users' learning and remembering how the site is organized, and
- promotion of the effectiveness and efficiency of users in finding what they are looking for (Usablenet, 2001).

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A Word from the Director

Teaching by Example

One of the roles and functions of a NIDRR grantee is not to be found in absolute priorities or stated project goals, objectives, and activities. That is, NIDRR grantees serve as a model for others who wonder how a variety of disability issues should be demonstrated in action. After all, many of us learn best by seeing principles and guidelines actually applied — in concrete form. This type of deductive learning style affords some the most effective way to learn the mechanics associated with implementation while clarifying less-specific concepts and approaches.

In other words, NIDRR grantees teach through their real-world examples. Either knowingly or unknowingly, others are reviewing your publicly-funded services and products as models of best approaches and strategies — particularly when it comes to accommodations for people with disabilities. This is also true in grantees' dissemination activities associated with the World Wide Web.

New regulations are prompting many to learn and implement standards of Web site accessibility. Section 508 regulations, for example, are requiring some Federal agencies to be concerned with specific issues of Web site accessibility and accommodation that may be new to them. As a result, NIDRR grantees' visibility and use as models of accessibility in dissemination can be expected to grow — not diminish — into the future.

Today, Web site accessibility seems all the more important when one recognizes recent data indicating that over half of all American households have a personal computer. Libraries and other public access points — including coffee shops, restaurants, and a variety of public service settings — also are providing unprecedented access to the Web. Clearly, the informational power of the Web is continuing to grow and the use of academic, educational information technologies in our public and private schools are skyrocketing.

This issue of *The Research Exchange* highlights some of the concerns and provisions that have been incorporated into Section 508 as well as other regulations that deal with Web site accessibility. It is important for NIDRR grantees to be aware of these regulations not only for compliance reasons but also because of our need to teach by example. Several highlights of work and resources available from NIDRR grantees in addressing Web site accessibility issues are also included in this issue.

It should be clear, however, that all NIDRR grantees serve as models for others and will, without a doubt, be more frequently looked to not only for their expertise in particular disability-related research areas but also as examples of high quality "implementers" of effective, efficient, and accessible dissemination strategies.

John D. Westbrook, Ph.D.
Director, NCDDR

New Emphasis on Accessibility for the World Wide Web, *continued from page 1*

Awareness of the need to provide accessibility features for people with disabilities when developing pages for the World Wide Web has grown as guidelines have been developed and policies implemented. Effective June 21, 2001, Section 508 of the 1998 Amendments to the Rehabilitation Act required that Federal departments' and agencies' electronic and information technology (E&IT) — including Web sites — be accessible to all.

> Section 508 requires that when Federal agencies develop, procure, maintain, or use electronic and information technology, they must ensure that it is accessible to people with disabilities, unless it would pose an undue burden to do so. Federal employees and members of the public who have disabilities must have access to and use of information and services that is comparable to the access and use available to non-disabled Federal employees and members of the public (Access Board, n.d.).

The standards issued by the Access Board on December 21, 2000 describe the basic requirements for accessibility of E&IT; the requirements for "Web-based Intranet and Internet Information and Applications" are found in Section 1194.22 (Access Board, 2000). Many items in the Section 508 standards are similar to the Priority 1 level checkpoints of the Web Content Accessibility Guidelines 1.0 (WCAG) developed by the World Wide Web Consortium (W3C, 1999b), but there are some variances. Some of the Priority 2 and 3 checkpoints are incorporated in the standards for Section 508. These differences are discussed in another article in this issue, **Section 508 and Web Accessibility Resources**, and a side-by-side comparison of the two standards is provided as a **Special Supplement for Web Designers**.

Following are the three priority levels described in the WCAG, and the impact of each level on accessibility (W3C, 1999a):

[Priority 1; A]
A Web content developer **must** satisfy this checkpoint. Otherwise, one or more groups will find it impossible to access information in the document. Satisfying this checkpoint is a basic requirement for some groups to be able to use Web documents.

[Priority 2; AA]
A Web content developer **should** satisfy this checkpoint. Otherwise, one or more groups will find it difficult to access information in the document. Satisfying this checkpoint will remove significant barriers to accessing Web documents.

[Priority 3; AAA]
A Web content developer **may** address this checkpoint. Otherwise, one or more groups will find it somewhat difficult to access information in the document. Satisfying this checkpoint will improve access to Web documents.

Although NIDRR grantees and other non-governmental entities are currently not required to comply with Section 508 standards, it is helpful to understand the requirements. Many NIDRR grantees have valuable expertise in other areas of electronic and information technology, as well as Web page development, which could inform government and industry in meeting accessibility requirements. Several NIDRR grantees are assisting Federal departments, agencies, and others as they learn about and implement Section 508 standards. For example, the Information Technology Technical Assistance and Training Center (ITTATC) offers a number of resources and works with partners that include other NIDRR grantees such as the Trace Center, Community Options, Inc., the World Institute on Disability, and the Disability and Business Technical Assistance Centers (DBTACs).

A review of NIDRR grantees' Web sites in 2000 found that 57% met the standards of WCAG Priority 1 requirements for accessibility (NCDDR, 2000). Priority 1 provides a minimum level of accessibility. The NCDDR Web site conforms to the Priority 2 (Double A) requirements, and we encourage all grantee Web sites to satisfy the Double A priority goal of removing "significant barriers to accessing Web documents" (W3C, 1999a). This would put NIDRR-funded Web sites at the forefront of accessibility through modeling attractive, usable, well-designed Websites, and put to rest the idea that accessible means plain, text-based, or boring.

Recent Trends in Internet Use

In 2001, Internet use continues to increase but at a slower pace after a number of years of fast growth. Recent data from the Census Bureau's Current Population Report, *Home Computers and Internet Use in the United States: August 2000*, shows that 51 percent of U.S. households in 2000 have one or more computers, compared to 42 percent in 1998. From 1984, growth in computers at home has risen by 500 percent. Internet use increased to 42 percent of U.S. households in 2000, up from 26 percent in 1998 (Newburger, 2001).

Different rates of computer ownership and Internet access were seen among diverse racial and ethnic groups. Among Whites, 58 percent have a computer in the home and 39 percent have Internet access. For Asian and

Effective June 21, 2001, Section 508 . . . required the that Federal departments' and agencies' electronic and information technology (E&IT) — including Web sites — be accessible to all.

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NCDDR Survey 2000: Computer and Internet Use, *continued from page 3*

Pacific Islanders, 66 percent have a computer and 44 percent have Internet access. Approximately 37 percent of Black and 35 percent of Hispanic households have a computer, and 21 percent and 18 percent, respectively, have Internet access (Newburger, 2001).

Internet subscribers in the U.S. numbered 70.7 million in the second quarter of 2001, according to TR's *Online Census*, a survey by Telecommunications Reports International (TRI). This figure represented a three percent increase from the first quarter of 2001, which had reflected a decrease from the last quarter of 2000. The survey showed that paid dial-up access continues to be the most popular way to access the Internet among U.S. users. Free dial-up, the next most frequent form of access to the Internet, showed an 11 percent decrease in the second quarter of 2001. Other Internet access modes, in order of the number of subscribers, were: cable modems, Digital Subscriber Line (DSL), Internet TV, and a new category, satellite. High speed DSL and satellite showed the fastest growth rates in the second quarter survey (Telecommunications Resources International, 2001).

A July 2001 report from InsightExpress suggests that the 'average' Internet user today is similar to the 'average' adult in the U.S., with 51 percent of all Internet users identified as female, the same percentage as in the general population. This contrasts with the early years of the Internet, when young males were the primary users. Factors such as age and income are also nearing the national averages (InsightExpress, 2001).

The Face of the Web II: 2000-2001, found that U.S. dominance in Internet use is decreasing as access to and use of the Internet grows around the world. In this report, 350 million adults were estimated to use the Internet. The U.S. still has the highest percentage of Internet users with 36 percent, down from 40 percent in 1999 (Ipsos-Reid, 2001a). A Nielsen/NetRating report for the first quarter of 2001 reported 429 million Internet users around the world, with 41 percent in the U.S. and Canada (Pastore, 2001).

Another study from Ipsos-Reid (2001b) gathered information from people who are not online and who do not intend to use the Internet. The most frequent reasons for not using the Internet were:

1. No need for the Internet (40%)
2. No computer (33%)
3. No interest (25%)
4. Don't know how to use it (16%)
5. Cost too high (12%)
6. No time (10%)

People with Disabilities and the Internet

The Disability Statistics Center (a NIDRR-funded RRTC) reported that nearly one-quarter (24 percent) of people with disabilities have access to a computer at home, compared to 52 percent of their non-disabled counterparts. The gap in Internet use is even more striking: Only ten percent of people with disabilities are on the Internet, compared to 38 percent of those without disabilities (Kaye, 2000a, 2000b). These data came from Census Bureau reports of the Current Population Survey, 1998 Computer and Internet Use Supplement and 1999 Annual Demographic Supplement.

In the NCDDR Survey 2000, 59 percent of consumer respondents reported they had a computer at home and 48 percent reported having Internet access (NCDDR, 2001). The respondents in the NCDDR survey were consumers with disabilities that participate in community-based Independent Living Center activities.

The National Council on Disability (NCD) reported on the Digital Divide and its impact on people with disabilities in its June 21, 2001 report, *The Accessible Future* (NCD, 2001). The report examined the status of access of people with disabilities to electronic and information technology as well as current related laws and policies.

"Access to E&IT is more and more the arbiter of success and the source of opportunity in education and employment. Under these circumstances, it should not be surprising that access to information and to the technology generating, transmitting, and storing it has become a civil rights issue for many people with disabilities and for our society. As the importance of electronic and information technology access grows in the way we conduct our lives, in the choices we make, and in the decisions others make about us, the importance of this issue can only grow (Conclusion of Executive Summary, NCD, 2001)."

Following are the overall recommendations from *The Accessible Future* (NCD, 2001) for improving access to E&IT for people with disabilities:

1. Incorporate E&IT accessibility into the agency planning and government-wide planning processes at all levels (p. 112)
2. Review the Federal contracting process to encourage diffusion of accessibility (p. 116)
3. Establish Federal Web site quality control (p. 118)
4. Systematically address the question of cost-effectiveness (p. 119)
5. Involve consumers in the accessibility process (p. 121)
6. Enrich the available resources for implementation of Section 508 (p. 122)
7. Record-keeping and data collection: to develop usable and informative cross-agency databases and information resources (p. 125)
8. Statutory review: to examine barriers to effective implementation of E&IT accessibility that may exist in current federal laws, and to recommend changes in law that will foster E&IT accessibility in the public and private sectors (p. 125-6)
9. Reinvigorate the quality and focus of ADA enforcement (p. 126)

10. Intensify monitoring and enforcement under Section 255 (p. 128)

Section 255 of the Telecommunications Act and Section 508 require Federal offices to procure accessible products and services from vendors. Product developers may be more motivated to ensure accessibility features for persons with disabilities in design and manufacturing processes, in order to secure government contracts. This may also encourage software developers to design packages with accessibility features built in. With the private sector involved, accessibility could become the norm and reflected in a "design-for-all" approach.

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NIDRR Grantees Promote Accessibility

In addition to resources on Section 508 and Web accessibility, this issue of *The Research Exchange* presents information from several NIDRR grantees describing their work in the area of accessibility and identifying resources that may be useful for other grantees.

The Web Accessibility Initiative (WAI) at the Massachusetts Institute of Technology has been funded in part by NIDRR since it began in 1997. Judy Brewer, Project Director, discusses the WAI project and how its resources can help NIDRR's grantees evaluate and improve the accessibility of their Web sites.

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The Center for An Accessible Society (Exploding Myths, Inc.) presents a common sense approach to the need for accessibility; from the Web site **http://www.accessiblesociety.org/**

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The NIDRR-funded Information Technology Technical Assistance And Training Center (ITTATC) was established at the Georgia Institute of Technology to help Federal agencies and industry meet the goals of accessibility required by Section 508. Shelley Kaplan, ITTATC Project Director, describes the Center and its resources, including a free online Web Accessibility Course and links to numerous training opportunities.

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The CPB/WGBH National Center for Accessible Media (NCAM) is a pioneer in media accessibility for people with disabilities. Geoff Freed describes MAGpie 2.0, a free application for digital captioning and audio description of multimedia formats, and other NIDRR-funded multimedia and distance education projects at NCAM.

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AbilityForum.com is a NIDRR-funded Small Business Innovative Research project that uses the Web as a dissemination channel for reaching consumers. Dawn Golden introduces the project and its resources.

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Web Accessibility: Today's Resources, Tomorrow's Challenges

Judy Brewer, Director
Web Accessibility Initiative (WAI)
World Wide Web Consortium (W3C)
Massachusetts Institute of Technology

Is your Web site accessible yet?

NIDRR-funded project Web sites can, and should, be models of Web accessibility for people with disabilities. What is the best way to get there? What resources are available to help make Web sites accessible? What accessibility issues will emerge with Web technologies in the future?

Over the past several years much progress has been made, through collaborative efforts of the many organizations participating in the World Wide Web Consortium's Web Accessibility Initiative, on developing accessibility solutions for the Web. These include guidelines for Web sites and Web-based software, as well as accessibility support built into core Web technologies such as HTML, Cascading Style Sheets (CSS), and Synchronized Multimedia Integration Language (SMIL).

The W3C's *Web Content Accessibility Guidelines 1.0* (WCAG 1.0) (see **http://www.w3.org/TR/WCAG/**) provide a comprehensive solution to making Web sites accessible for people with visual, auditory, physical, cognitive and neurological disabilities. WCAG 1.0 has three conformance levels; to ensure an effective level of accessibility, Double-A (all priority one and two checkpoints) is recommended. The Checklist of *Checkpoints for WCAG 1.0* provides a helpful starting point for using the guidelines (see **http://www.w3.org/TR/WCAG10/full-checklist.html**). It lists checkpoints in order of priority, and according to different Web features such as tables,

frames, etc., and explains what is needed to make these accessible.

First steps towards an accessible Web site include setting a clear internal policy about the expected conformance level by your organization, and reviewing organizational procedures and resources involved in building and maintaining your Web site. For instance, when setting an internal policy, it is useful to consider issues such as third-party materials provided on your site, and ensure that those materials can also meet the expected conformance level. It is helpful to set milestones for conformance, and to provide means for the appropriate people to receive training and software that will help them get the job done. Some provision for evaluation and ongoing monitoring of the Web site is also essential, and for follow-up when inaccessible portions of the site are identified.

How does one develop, and evaluate, a Web site for accessibility?

Accessibility is equally important for new and existing Web sites. The selection of software is a key first step. When selecting software for building Web sites, take the opportunity to ask whether that software supports the creation of accessible Web content. One indicator of this is implementation of W3C's *Authoring Tool Accessibility Guidelines 1.0 (ATAG 1.0)* (see **http://www.w3.org/TR/ATAG10/**). There are currently several software developers working on Level-A-conformant implementations of ATAG 1.0. The more questions that software developers receive regarding their support of W3C's ATAG 1.0, the more rapidly they will realize the marketplace interest in software supporting accessible content creation.

In designing a new site, it is important not to assume that text-only pages are an adequate solution for accessibility — since they only address the needs of people with some disabilities but do not work effectively for other disabilities — but rather to ensure that mainstream Web sites are designed to accommodate accessibility. In addition, rather than waiting until the end of the development process to evaluate a new Web site, it is best to perform evaluations on an ongoing basis throughout the development process.

It can be useful to think of two "levels" of evaluation of Web sites: *preliminary review*, which provides a quick but imprecise indicator of general problems on a site; and *comprehensive evaluation*, which provides a more reliable indicator of the conformance level of a Web site and identifies design problems much more precisely. Accessibility encompasses many different kinds of issues — availability and appropriateness of alternative text, consistency of navigation elements on Web pages, appropriateness of underlying markup for tables, frames, and image maps, etc. Some of these are easy to check with automatic tools, but some are not, so an effective evaluation always involves using a combination of different approaches.

A *preliminary review* involves selecting a representative sampling of pages from a Web site and turning off certain features on your browser (images, sounds); printing out pages to check color contrast; tabbing through links within pages to check tabbing order; changing the font size, etc.; then running one or two semi-automated accessibility checkers, and/or voice browsers or text emulators over the pages. Again, this provides only a glimpse of the issues and is not reliable for determining conformance level.

A *comprehensive evaluation* can include the use of semi-automatic evaluation and validation tools — for instance, validation of HTML, CSS, and/or Extensible Markup Language (XML), and semi-automated accessibility, spelling, and grammar checking; manual evaluation using text and voice browsers, turning off various features in a GUI (graphical user interface) browser, reviewing for readability and consistency of navigation; and having novice and expert users with different disabilities evaluate the site. A comprehensive evaluation might be used less frequently than preliminary reviews, but can give valuable information on the overall usability of a Web site above and beyond the information it provides on accessibility of the site.

W3C's Web Accessibility Initiative provides, and links to, a variety of resources which can help in developing and evaluating accessible Web sites. An annotated listing of WAI Resources is available at **http://www.w3.org/WAI/Resources/**.

How will advanced Web technologies affect accessibility?

The technologies of the Web are continually evolving. This has both advantages and disadvantages for people with disabilities. One interesting advantage of current Web trends is that the proliferation of new devices to access the Web (mobile phones, palm-tops, Web TV, auto-based PC's, information kiosks, etc.) provide even more motivation for development of accessible Web sites, since Web accessibility is one of the best foundations for device-independent access to the Web. Correspondingly, the mobile phone industry has become very interested in WAI's work.

Some areas of evolving Web technology can be a two-edged sword. For example, the expansion of voice-based access to the Web is a boon to people with visual and/or physical disabilities, but a barrier for people with auditory and/or speech disabilities when designers forget to include alternative means for input/output.

The expanding interest in "fixed formats" can be a threat to accessibility of the Web unless managed very carefully. Sometimes through confusion regarding technical solutions available for Digital Rights Management (DRM), information providers feel that they must maintain total control over the visual appearance of documents, and choose to do so by freezing pages to allow only visual rendering — deliberately excluding the ability of screen reader software to access the content of documents and essentially shutting out users of screen readers. Technologies developed by W3C are reviewed for potential accessibility barriers prior to their release. For example, in the development of W3C's Scalable Vector Graphics (SVG), WAI worked internally in W3C to address potential accessibility

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Web Accessibility: Today's Resources, Tomorrow's Challenges, *continued from page 7*

concerns in the area of fixed formats.

One of the W3C's primary areas of advanced development currently is the Semantic Web Activity. This focuses on the development of machine-understandable data on the Web, enabling automation, integration and reuse of data across various applications. The Semantic Web should offer a variety of benefits for Web accessibility, including the ability to link more broadly to resources on the Web that can support accessible description and/or rendering of Web content.

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How can one participate in W3C's Web Accessibility Initiative?

The W3C's Web Accessibility Initiative works to improve accessibility of the Web on a number of levels, including the core technologies of the Web; developing guidelines for Web accessibility; facilitating development of tools for evaluating accessibility; developing educational and outreach materials around Web accessibility; and coordinating with research and development that can affect future accessibility of the Web.

All areas of WAI work involve collaboration among many organizations including industry, disability organizations, governments, and research organizations from around the world. Participation is possible via W3C membership or via invited expert status. Information about participation opportunities is available on the WAI Web site at **http://www.w3.org/WAI**.

The development of accessibility guidelines is ongoing, including technical implementation support materials for existing guidelines, and development of advanced guidelines in the areas of Web content, authoring tools, and "user agents" — browsers and multimedia players. There is also ongoing work in development of educational and outreach materials, such as curriculum, implementation planning guides, business case, quick tips, and other resources which become available for broad public use. For questions about WAI work, please visit the Web site at **http://www.w3.org/WAI**.

Making Web Sites Accessible is Just Common Sense

One in five Americans has some disability; as the country ages, that percentage is expected to increase. A Web site that's navigable by an assistive technology such as a screen reader is also accessible by phones and palmtops, not to mention by old, slow computers.

Starting June 21, 2001, electronic and information technology products and services that Federal agencies buy must meet new accessibility standards. Federal agencies must also follow these standards. This includes computers and Internet Web sites. It's part of Section 508 of the 1973 Rehabilitation Act, which was revised in 1998. The section spells out, for the first time, standards for developing accessible Web pages.

Considering the number of people who use the Internet who need a way to listen to text and navigate with voice, Web accessibility makes sense. What are the implications of requiring the Internet to be accessible to everyone?

While opponents of access claim it is costly to provide access, in fact the opposite is true: It is the added-on graphics and other showy displays of sound and animation that are costly — both to produce and to maintain.

Basic access is built into the architecture of the World Wide Web and has been since the infancy of the Internet, as Judy Brewer of the World Wide Web Consortium can explain. But even sites that today operate with high-end graphics and sound displays can easily be made accessible. Accessible sites have many advantages:

- Many Web surfers today eagerly look for a "text-only" link on a home page, or simply turn off the graphics option on their browser so sites will load faster and they can avoid the screaming ad-based content of graphics-bloated sites.
- As personal digital assistants become more popular, text-based content becomes important. (Because the screens on such devices are so small, graphics will probably never be a viable option.)
- The busy executive waiting in an airport who wants to check her stock portfolio on her cell phone isn't going to turn to a graphics-only site.
- With the growth of voice technology, the harried commuter can have the headlines from his favorite news site read to him as he drives — but only if there is a text-based version.
- Ever try to find a particular scene from your favorite video by pushing — and re-pushing — the "fast forward" button, then the "replay," over and over? If digitized video had synchronized captions, its text could be searched instantaneously. That's another benefit of access.

From The Center for An Accessible Society.
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http://www.accessiblesociety.org/topics/webaccess/index.htm

Information Technology Technical Assistance and Training Center (ITTATC)

Shelley Kaplan
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Rapid advances in our nation's electronic and information technology (E&IT) industries have revolutionized the way we work, play and communicate. Current and emerging technologies have created opportunities for some but barriers for others in our society. In his recent remarks, FCC Commissioner Michael Copps stated that "...[The] IT Economy, the Digital Age, the World Wide Web or whatever you will, is rocketing us into cyberspace at the speed of light. It's valuable cyberspace, because what we find there are the education and information and commerce and jobs of America's future. Those who get there win; those who don't get there lose. I want to contribute to making sure we all get there, and that in the vanguard, traveling at the speed of light, is America's disability community" (Copps, 2001).

In 1998, Congress amended the Rehabilitation Act to require Federal agencies to make their electronic and information technology accessible to people with disabilities. Under Section 508, Federal agencies must provide employees with disabilities and members of the public access to this technology that is comparable to the access available to others. Section 508 was enacted to eliminate barriers in information technology, to make available new opportunities for people with disabilities, and to encourage development of technologies that will help achieve these goals (1998 Amendment to Section 508 of the Rehabilitation Act, 2000).

To address the barriers and broaden the opportunities, the Georgia Institute of Technology's Center for Assistive Technology and Environmental Access (CATEA), with funding from NIDRR, has established the national Information Technology Technical Assistance and Training Center (ITTATC).

ITTATC believes that there will be positive change in industry's ability to design accessible products and services. Toward this end, ITTATC promotes the creation, use and dissemination of accessible E&IT by providing technical assistance, training and information. ITTATC also seeks to facilitate accessible E&IT services and products by influencing:

- How new products are designed
- How existing products interface better or incorporate accessible design features
- Industry and state level practices by documenting "successful approaches for achieving accessible E&IT products and services that are accessible to and usable by a broad range of people with disabilities"

Established in November 2000, the ITTATC works with a distinguished group of leaders in education, disability, research, industry, and policy to develop and implement comprehensive approaches designed to accomplish ITTATC's objectives. Following are ITTATC's partner organizations and their roles:

- **The Information Technology Association of America (ITAA)** assists with linking members of the information technology and telecommunications industry with the ITTATC and the information and services resulting from the ITTATC. ITAA also assists with dissemination to industry through various conference opportunities.
- **The World Institute on Disability (WID)** collaborates in the development of training materials, needs assessment, curriculum development, training and other dissemination activities.
- **Community Options, Inc.** provides assessment of and dissemination and training to the state level information and procurement officers. They collaborate to develop an assessment protocol for the states on Section 508.
- **The Trace Center** provides ongoing consultative services and training related to the research results from two Rehabilitation Engineering Research Centers, one on Information Technology Access and one on Access to Telecommunications.
- **Inclusive Technologies** provides ongoing consultative services related to accessible design and advances in the telecommunications and information technology industry.
- **Regional Disability and Business Technical Assistance Centers (DBTACs)** provide information, technical assistance and referral on Sections 508 and 255 to consumers, disability-related organizations, state procurement officials, and businesses about accessible electronic and information technology and telecommunications equipment and services.
- **The Association of Tech Act Projects (ATAP)** collaborates with RESNA on a series of activities to identify and respond to information, training, and technical assistance needs of State Chief Information and Procurement Officials about accessible electronic and information technology.
- **National Advisory Council (NAC)** is comprised of representatives from the electronic and information technology industry, federal and state government, and disability organizations and advises the ITTATC project in promoting the intent of Section 508 of the Rehabilitation Act and Section 255 of the Telecommunications Act.

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Information Technology Technical Assistance and Training Center (ITTATC), *continued from page 9*

Over the next five years, ITTATC will:

- Create and maintain a Website that is a portal to information and resources about E&IT;
- Conduct an array of training and technical assistance programs on designing accessible products and services. These programs will be developed and conducted in partnership with ITTATC's collaborators, in multiple formats (including Webcasts, online courses, workshops and presentations), for people with disabilities and for E&IT and telecommunication manufacturers and developers;
- Promote opportunities for positive interactions between industry, government and disability leaders to increase mutual understanding; and
- Evaluate and track results of project activities with regulators, industry, government, and E&IT users with disabilities.

ITTATC Web site

Web accessibility is more than the sum of its parts. In other words, meeting the technical standards set forth by the Center for Applied Special Technology's BOBBY accessibility validation software (CAST, 2000) and the World Wide Web Consortium's Web Accessibility Initiative (W3C, 2001) are essential, but even they are not enough to make a Web site truly accessible. You might have a forest of accessible pages that defeat the purpose of access to all because the information available is poorly presented and difficult to find, or to understand, once the user finds it. One of the most important aspects of Web accessibility is "usability," a combination of factors that affect the ease and effectiveness of the user's experience.

Although the earlier version of the ITTATC Web site was accessible according to all published specifications, the usability of the site was not up to the standard of accessibility that ITTATC staff wanted to present. The wealth of information that ITTATC presented was buried under endless sublevels and frequently a user would have to hunt to find a document. It was necessary to make the search far more intuitive and to present users with a promise of success in their search for information, from the first sight (or sound, for those using JAWS). For this reason, ITTATC discarded the tool of using sub-navigation, which was cumbersome and often ineffective.

In its place, the *Tools and Topics* method of navigation was adopted. Instead of using sub-navigation and relying on the short blurbs that can be written into link titles or 'ALT' (alternative text) tags, this method gives prominent display to all the major sections of the site and provides a permanent brief statement about the role of each section, and is carried as far down into each section as is necessary. The navigation bars contain featured items hosted by ITTATC, which have been evaluated as the type of information or utilities that ITTATC wants to be constantly available to its users. By combining this user-centered essential design with the technical standards of Web accessibility, ITTATC has recreated itself as a Web site that is fully accessible, from a technical standpoint and from the user-centered perspective.

Please visit the ITTATC Web site **http://www.ittatc.org** frequently. Information and resources are expanding and evolving almost on a daily basis. While in the process of development, your comments and feedback are greatly appreciated. For more information, please contact ITTATC via the Web site; toll free at 1-866-9-ITTATC (866-949-8282); or by surface mail:

Information Technology Technical Assistance & Training Center
Georgia Institute of Technology
Center for Assistive Technology & Environmental Access
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Section 508 Web Standards and WCAG Priority 1 Checkpoints:

A Side-by-Side Comparison

By: Jim Thatcher

Available online:
http://jimthatcher.com/sidebyside.htm

Sponsored by the Association of Tech Act Projects (ATAP)
http://www.ataporg.org/

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http://jimthatcher.com/sidebyside.htm

Author notes: In 1998-99, Jim Thatcher served as Vice-chair of the Electronic and Information Technology Access Advisory Committee impaneled by the Access Board to propose standards for Section 508. Dr. Thatcher is the author of a course on Section 508 Web Accessibility, developed for the Information Technology and Technical Assistance and Training Center (ITTATC) and available on the ITTATC Web site. Contact him at jim@jimthatcher.com or call 512-306-0931.

Overview

The intention here is to compare the Priority 1 Web Content Accessibility checkpoints developed by the World Wide Web Consortium (W3C) with the Section 508 Web accessibility standards developed by the Architectural and Transportation Barriers Compliance Board (the Access Board). However, some of the 508 standards relate to lower priority checkpoints from the Web Accessibility Initiative. The view of the Web Content Accessibility Guidelines 1.0 (WCAG) lists only the Priority 1 checkpoints. The Section 508 view includes Priority 2 and 3 checkpoints in the comparison.

The first table, titled *The WCAG View*, lists the Priority 1 Web Content Accessibility checkpoints followed by a comparison phrase like "the same," and then the relevant Section 508 Web accessibility standard or standards. An explanation follows those entries where there are differences between the two standards.

The second table is titled, *The 508 View*. It lists all the 508 standards, and for each one, the comparison phrase, and the relevant WCAG checkpoint or checkpoints. An explanation follows those entries where there are differences between the two standards.

The following three short sections introduce the 508 standards, the WCAG Priority 1 checkpoints, and some resources.

Section 508 Web Accessibility

"Section 508" refers specifically to Section 508 of the Rehabilitation Act of 1973, as amended by the Workforce Investment Act of 1998. The law requires Federal agencies to purchase electronic and information technology that is accessible to employees with disabilities, and to the extent that those agencies provide information technology to the public, it too shall be accessible by persons with disabilities.

Actually Section 508 was included in an amendment to the Rehabilitation Act in 1986, with the requirement that the Federal Government provide accessible technology to employees and to the public. But the 1986 version provided no guidance for determining accessibility of information technology and there were no enforcement procedures.

The 1998 amendment addressed both these issues. The Access Board was assigned the task of determining standards for accessible electronic and information technology. Although the law applies to the development, procurement, maintenance, or use of all electronic and information technology, it is in the procurement where the enforcement lies.

The result of the effort by the Access Board is a set of standards for accessible electronic and information technology. That document includes an extensive

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discussion on the development of the standards. The specific standards address:

- Software applications and operating systems (§ 1194.21)
- Web-based intranet and Internet information and applications (§ 1194.22)
- Telecommunications products (§ 1194.23)
- Video or multimedia products (§ 1194.24)
- Self-contained closed products such as copiers (§ 1194.25)
- Desktop and portable computers (§ 1194.26).

Our interest here is § 1194.22, standards for accessible Web-based intranet and Internet information and applications.

The accessibility standards of Section 508 apply to Federal agencies purchasing electronic and information technology. It is hoped that the market pressure of Federal procurement will have a much broader effect than just making Federal information technology accessible, though even that is a significant goal.

In particular, the requirements of Section 508 do not extend to recipients of Federal funds or private businesses. There is one notable exception to this exemption. According to the ATAP site (specifically their Information Technology Assessment), "states which receive Federal funds under the Assistive Technology Act of 1998 are required by that Act to provide an assurance of compliance with Section 508. Currently all 50 states and all territories receive Assistive Technology Act dollars and all have some form of Section 508 assurance."

This comparison of the WCAG Priority 1 checkpoints and the Section 508 Web accessibility standards is of interest to states because some have chosen to use the Web Content Accessibility Guidelines as the criterion for Web accessibility

The Web Accessibility Initiative Guidelines

The Web Accessibility Initiative (WAI) was formed by the W3C in order to bring accessibility considerations into the technology development of the Web Consortium and to determine guidelines for accessible technology including Web authoring and user agents (browsers). As Tim Berners-Lee, the inventor of the Web, and the Director of the W3C put it, "The power of the Web is in its universality. Access by everyone regardless of disability is an essential aspect."

The first version of the authoring guidelines, the Web Content Accessibility Guidelines 1.0, became a W3C Recommendation on May 5, 1999.

The Guidelines are further organized into a checklist. The checkpoints are categorized as Priority 1, 2 or 3. Here is the characterization of those priorities from the Guidelines:

[Priority 1] A Web content developer **must** satisfy this checkpoint. Otherwise, one or more groups will find it impossible to access information in the document. Satisfying this checkpoint is a basic requirement for some groups to be able to use Web documents.

[Priority 2] A Web content developer **should** satisfy this checkpoint. Otherwise, one or more groups will find it difficult to access information in the document. Satisfying this checkpoint will remove significant barriers to accessing Web documents.

[Priority 3] A Web content developer **may** address this checkpoint. Otherwise, one or more groups will find it somewhat difficult to access information in the document. Satisfying this checkpoint will improve access to Web documents.

This side-by-side comparison looks first at the Priority 1 WCAG checkpoints (*The WCAG View*) and compares each with relevant Section 508 Web standards. On the other hand, *The Section 508 View* lists all the 508 Web standards and compares these to WCAG checkpoints; *some checkpoints of Priority 2 and 3 are related to the 508 standards*

Implementation Resources

The Web Content Accessibility Guidelines are keyed to a techniques document, Techniques for Web Content Accessibility Guidelines 1.0, which gives techniques for supporting each checkpoint. In addition there are training resources on the WAI site.

The Access Board has released an informative guide to the Web standards that is linked to the Access Board Section 508 site. The Information Technology Technical Assistance and Training Center (ITTATC) is funded to support Section 508. There are many resources available on the ITTATC site. A tutorial on Web accessibility for section 508 was written for ITTATC and is now available: **http://www.ittatc.org/training/webcourse/**

There are commercial sites that also offer guidelines for Web accessibility. The IBM Web Accessibility Guidelines include documentation on rationale, implementation techniques and testing Microsoft's Web Guidelines are in the form of 12 Tips for Web Accessibility, and the page includes code examples and information on testing. Both Microsoft and IBM sites include links to other resources, as does the Web Accessibility Initiative site.

The WCAG View

NOTE: Four WCAG Priority 1 checkpoints, 1.3, 4.1, 6.2 and 14.1, are listed as "not in 508," in the Comparison column of this table. If a Web site is 508-compliant and its author wants to be Web Accessibility Initiative A-Compliant as well, these are the only four checkpoints he or she must address additionally.

Keywords	WCAG Priority 1	Comparison	Section 508
Text equivalent	**1.1** Provide a text equivalent for every non-text element (e.g., via "alt," "longdesc," or in element content). This includes: images, graphical representations of text (including symbols), image map regions, animations (e.g., animated GIFs), applets and programmatic objects, ASCII art, frames, scripts, images used as list bullets, spacers, graphical buttons, sounds (played with or without user interaction), stand-alone audio files, audio tracks of video, and video.	Similar	**1194.22 (a)** A text equivalent for every non-text element shall be provided (e.g., via "alt," "longdesc," or in element content).

The Section 508 standard uses the exact language of WCAG Checkpoint 1.1 without "This includes" of WCAG 1.1. Given the decision of the Access Board to use the WCAG wording, it follows that the examples of "non-text elements" in WCAG 1.1 apply to Section 508 1194.22 (a) as well. This is further confirmed in the discussion that precedes the standards mentioning audio as an example of non-text elements.

> The Board also interprets this provision to require that when audio presentations are available on a Web page, because audio is a non-textual element, text in the form of captioning must accompany the audio, to allow people who are deaf or hard of hearing to comprehend the content.

It was an error to refer to captioning of audio in the final standards. The guides to the standards clarify this (see 1194.22 (b)).

> If a website offers audio files with no video, do they have to be captioned?
>
> No, because it is not multimedia. However, since audio is a non-text element, a text equivalent, such as a transcript, must be available. Similarly, a (silent) Web slide show presentation does not need to have an audio description accompanying it, but does require text alternatives to be associated with the graphics.

For spacer images, those used for formatting output, the text equivalent is the empty string, alt=" ", and that is the alternative text that should be associated with those images.

The issue of text equivalents for scripts, applets and programmatic objects is quite a different matter. It is rare that there is such a thing as a "text equivalent" for one of these programmatic objects. Such is often interpreted as a functional description of the object, as in "this applet provides an interface for logging in to view your 401K account."

The picture is complicated by the role of such extensions to HTML in WCAG 1.0 compared to that in Section 508. For the former the pages must be usable with scripts and applets turned off or not supported. This makes the importance of the "text equivalent" much greater for WCAG compliance compared with Section 508. For section 508 these extensions must be accessible (see Paragraphs 1194.22 (l) and 1194.22 (m)).

Keywords	WCAG Priority 1	Comparison	Section 508
Server-side image maps	**1.2** Provide redundant text links for each active region of a server-side image map	The same	**1194.22 (e)** Redundant text links shall be provided for each active region of a server-side image map.
Auditory description	**1.3** Until user agents can automatically read aloud the text equivalent of a visual track, provide an auditory description of the important information of the visual track of a multimedia presentation.	Not in 508	

By WCAG 1.1 and 1.4 (Section 508 1194.22 (a) and (b)) video must have a synchronized text equivalent. Given the Web environment it is natural to assume that the synchronized text equivalent could be displayed in a window next to (or above or below) the video just like captions. The problem addressed by WCAG 1.3 is that blind users, for whom this is important, do not today have access to that text; their screen readers won't read the descriptions of the video. Until they do, WCAG 1.3 requires that the text description of the video be presented in audio.

Video on the Web that has text descriptions of important video information will conform to the Section 508 Web standards.

However, in the discussion of the standards, the Access Board specifically referred to the multimedia section of the standards:

> The Board did not adopt WCAG 1.0 Checkpoint 1.3, which provides that ..."[u]ntil user agents can automatically read aloud the text equivalent of a visual track, provide an auditory description of the important information of the visual track of a multimedia presentation..." Although the NPRM did not propose addressing this issue in the Web section, there was a similar provision in the multimedia section of the NPRM.

Indeed there is a similar provision in the final rule as well. Paragraph 1194.24 (d) of the multimedia section (cited above) requires that training and informational multimedia productions that support the agency's mission shall have audio descriptions.

Keywords	WCAG Priority 1	Comparison	Section 508
Synchronized multimedia	**1.4** For any time-based multimedia presentation (e.g., a movie or animation), synchronize equivalent alternatives (e.g., captions or auditory descriptions of the visual track) with the presentation.	The same	**1194.22 (b)** equivalent alternatives for any multimedia presentation shall be synchronized with the presentation.
Color	**2.1** Ensure that all information conveyed with color is also available without color, for example from context or markup.	The same	**1194.22 (c)** Web pages shall be designed so that all information conveyed with color is also available without color, for example from context or markup.
Natural language	**4.1** Clearly identify changes in the natural language of a document's text and any text equivalents (e.g., captions).	Not in 508	

The Access Board determined that:

1. The intent of 4.1 is to for Web authors to indicate change in natural language with markup (lang="en"), not using in-line text, like "the following is in German."
2. Not many assistive technologies support language change markup.

Based on that determination, the Access Board decided not to include this checkpoint as a standard for Section 508.

Keywords	WCAG Priority 1	Comparison	Section 508
Table headers	**5.1** For data tables, identify row and column headers.	The same	**1194.22 (g)** Row and column headers shall be identified for data tables.
Complex tables	**5.2** For data tables that have two or more logical levels of row or column headers, use markup to associate data cells and header cells.	The same	**1194.22 (h)** Markup shall be used to associate data cells and header cells for data tables that have two or more logical levels of row or column headers.
Style sheets	**6.1** Organize documents so they may be read without style sheets. For example, when an HTML document is rendered without associated style sheets, it must still be possible to read the document.	The same	**1194.22 (d)** Documents shall be organized so they are readable without requiring an associated style sheet.
Dynamic content	**6.2** Ensure that equivalents for dynamic content are updated when the dynamic content changes.	Not in 508	

The Access board did not include this checkpoint in the Section 508 standards for Web accessibility because it was deemed unclear.

The purpose of Checkpoint 6.1 is to back up other checkpoints, like 6.3, that require text alternatives for dynamic content. Checkpoint 6.2 says the text alternatives must be kept up-to-date. The techniques document for this checkpoint (http://www.w3.org/TR/WCAG10-HTML-TECHS/#scripts-alt) gives an example of using the NOSCRIPT element displaying sports scores in a definition list while the script would present the scores in a "bill board." This checkpoint requires that these two presentations are displaying the same scores.

Another example of this, my favorite, is a JavaScript function that displays the date the page was last updated at the bottom of a Web page by querying the file date. This can ensure that the update information is current without having to change the update information every time the page is modified. But if you use the NOSCRIPT option as a text alternative to that dynamic content, the NOSCRIPT content would have to be updated every time the page was modified by this checkpoint, thereby nullifying the usefulness of the script.

Keywords	WCAG Priority 1	Comparison	Section 508
Scripting	**6.3** Ensure that pages are usable when scripts, applets, or other programmatic objects are turned off or not supported. If this is not possible, provide equivalent information on an alternative accessible page.	WCAG more restrictive	**1194.22 (l)** When pages utilize scripting languages to display content, or to create interface elements, the information provided by the script shall be identified with functional text that can be read by assistive technology. **1194.22 (m)** When a Web page requires that an applet, plug-in or other application be present on the client system to interpret page content, the page must provide a link to a plug-in or applet that complies with 1194.21(a) through (l).

The WCAG checkpoint is much easier to interpret; your pages have to be usable when scripts, applets and other programmatic objects are turned off. If your page satisfies this checkpoint then it is likely that you also satisfy the corresponding Section 508 standards cited above.

However, the presumption of the Section 508 standards is that scripting, applets and other programmatic objects will be turned on (and supported) and those all must be accessible. So, if your site uses scripting just for visual enhancements, like changing text attributes when the mouse moves over text, then the site satisfies both WCAG 6.3 and Paragraph 1194.22 (l).

If you use "fly-over" menus implemented in JavaScript, and all the submenu items are available as normal text links, then the site satisfies both 6.3 and 1194.22 (l).

However, if you use Document.write to place (important) text on your page while it is loading, then it will be functional text available to assistive technology. Assuming that the text is important, the site fails WCAG 6.3 but passes 1194.22 (l).

Keywords	WCAG Priority 1	Comparison	Section 508
Flicker	**7.1** Until user agents allow users to control flickering, avoid causing the screen to flicker.	508 more specific	**1194.22 (j)** Pages shall be designed to avoid causing the screen to flicker with a frequency greater than 2 Hz and lower than 55 Hz

The Section 508 standard 1194.22(j) is intended to be consistent with WCAG checkpoint 7.1 adding only a specific range of frequencies to be avoided. In particular, the Access Board stated in the final rule:

> Paragraphs (j) and (k) are meant to be consistent with similar provisions in the WCAG 1.0, however, the final rule uses language which is more consistent with enforceable regulatory language.

It can be argued that 1194.22(j) is actually more restrictive because most flickering can be controlled in the major browsers by pressing the Escape key.

Keywords	WCAG Priority 1	Comparison	Section 508
Client-side image maps	**9.1** Provide client-side image maps instead of server-side image maps except where the regions cannot be defined with an available geometric shape.	The same	**1194.22 (f)** Client-side image maps shall be provided instead of server-side image maps except where the regions cannot be defined with an available geometric shape.
Text only last resort	**11.4** If, after best efforts, you cannot create an accessible page, provide a link to an alternative page that uses W3C technologies, is accessible, has equivalent information (or functionality), and is updated as often as the inaccessible (original) page.	The same	**1194.22 (k)** A text-only page, with equivalent information or functionality, shall be provided to make a Web site comply with the provisions of this part, when compliance cannot be accomplished in any other way. The content of the text-only page shall be updated whenever the primary page changes.
Frames	**12.1** Title each frame to facilitate frame identification and navigation.	The same	**1194.22 (i)** Frames shall be titled with text that facilitates frame identification and navigation.

For both of these requirements, be sure to include meaningful name and title attributes on frame elements.

Keywords	WCAG Priority 1	Comparison	Section 508
Clear language	**14.1** Use the clearest and simplest language appropriate for a site's content.	Not in 508	

The Access Board decided against including this checkpoint as a standard for Web accessibility because it was deemed too difficult to enforce. The requirement to use clearest and simplest language can be very subjective.

Listed at right are URLs for some of the resources on the Web that are mentioned in the introductory notes to this document:

Section 508 Standards
http://www.access-board.gov/news/508-final.htm

Guide to Web-based Intranet and Internet Information and Applications (1194.22)
http://www.access-board.gov/sec508/guide/1194.22.htm

Information Technology Technical Assistance and Training Center (ITTATC)
http://www.ittatc.org

Web Content Accessibility Guidelines 1.0
http://www.w3.org/TR/WCAG10/

Checklist of Checkpoints for Web Content Accessibility Guidelines 1.0
http://www.w3.org/TR/WCAG10/full-checklist.html

Techniques for Web Content Accessibility Guidelines 1.0
http://www.w3.org/TR/WAI-WEBCONTENT-TECHS/

Web Accessibility Initiative Resources
http://www.w3.org/WAI/Resources/

The Section 508 View

NOTE: If a Web site is WCAG A-Compliant and its author wants to be Section 508 compliant as well, these are the five standards he or she must address additionally: paragraphs 1194.22 (l), (m), (n), (o), and (p).

Keywords	Section 508	Comparison	WCAG Priority 1
Text equivalent	**1194.22 (a)** A text equivalent for every non-text element shall be provided (e.g., via "alt," "longdesc," or in element content).	Similar	**1.1** Provide a text equivalent for every non-text element (e.g., via "alt," "longdesc," or in element content). This includes: images, graphical representations of text (including symbols), image map regions, animations (e.g., animated GIFs), applets and programmatic objects, ASCII art, frames, scripts, images used as list bullets, spacers, graphical buttons, sounds (played with or without user interaction), stand-alone audio files, audio tracks of video, and video.

The Section 508 standard uses the exact language of WCAG Checkpoint 1.1 without "This includes" of WCAG 1.1. Given the decision of the Access Board to use the WCAG wording, it follows that the examples of "non-text elements" in WCAG 1.1 apply to Section 508 1194.22 (a) as well. This is further confirmed in the discussion that precedes the standards mentioning audio as an example on non-text elements.

> The Board also interprets this provision to require that when audio presentations are available on a Web page, because audio is a non-textual element, text in the form of captioning must accompany the audio, to allow people who are deaf or hard of hearing to comprehend the content.

It was an error to refer to captioning of audio in the final standards. The guides to the standards clarify this (see 1194.22 (b)).

> If a website offers audio files with no video, do they have to be captioned?
>
> No, because it is not multimedia. However, since audio is a non-text element, a text equivalent, such as a transcript, must be available. Similarly, a (silent) Web slide show presentation does not need to have an audio description accompanying it, but does require text alternatives to be associated with the graphics.

For spacer images, those used for formatting output, the text equivalent is the empty string, alt="", and that is the alternative text that should be associated with those images.

The issue of text equivalents for scripts, applets and programmatic objects is quite a different matter. It is rare that there is such a thing as a "text equivalent" for one of these programmatic objects. Such is often interpreted as a functional description of the object, as in "this applet provides an interface for logging in to view your 401K account."

The picture is complicated by the role of such extensions to HTML in WCAG 1.0compared to that in Section 508. For the former the pages must be usable with scripts and applets turned off or not supported. This makes the importance of the "text equivalent" much greater for WCAG compliance compared with Section 508. For section 508 these extensions must be accessible (see Paragraphs 1194.22 (l) and1194.22 (m)).

Keywords	Section 508	Comparison	WCAG Priority 1
Synchronized multimedia	**1194.22 (b)** Equivalent alternatives for any multimedia presentation shall be synchronized with the presentation.	The same	**1.4** For any time-based multimedia presentation (e.g., a movie or animation), synchronize equivalent alternatives (e.g., captions or auditory descriptions of the visual track) with the presentation.
Color	**1194.22 (c)** Web pages shall be designed so that all information conveyed with color is also available without color, for example from context or markup.	The same	**2.1** Ensure that all information conveyed with color is also available without color, for example from context or markup.
Style sheets	**1194.22 (d)** Documents shall be organized so they are readable without requiring an associated style sheet	The same	**6.1** Organize documents so they may be read without style sheets. For example, when an HTML document is rendered without associated style sheets, it must still be possible to read the document.
Server-side image maps	**1194.22 (e)** Redundant text links shall be provided for each active region of a server-side image map	The same	**1.2** Provide redundant text links for each active region of a server-side image map.
Client-side image maps	**1194.22 (f)** Client-side image maps shall be provided instead of server-side image maps except where the regions cannot be defined with an available geometric shape.	The same	**9.1** Provide client-side image maps instead of server-side image maps except where the regions cannot be defined with an available geometric shape
Table headers	**1194.22 (g)** Row and column headers shall be identified for data tables.	The same	**5.1** For data tables, identify row and column headers.
Complex tables	**1194.22 (h)** Markup shall be used to associate data cells and header cells for data tables that have two or more logical levels of row or column headers.	The same	**5.2** For data tables that have two or more logical levels of row or column headers, use markup to associate data cells and header cells.
Frames	**1194.22 (i)** Frames shall be titled with text that facilitates frame identification and navigation.	The same	**12.1** Title each frame to facilitate frame identification and navigation.
Flicker	**1194.22 (j)** Pages shall be designed to avoid causing the screen to flicker with a frequency greater than 2 Hz and lower than	508 more specific	**7.1** Until user agents allow users to control flickering, avoid causing the screen to flicker.

The Section 508 standard 1194.22(j) is intended to be consistent with WCAG checkpoint 7.1 adding only a specific range of frequencies to be avoided. In particular, the Access Board stated in the final rule:

Paragraphs (j) and (k) are meant to be consistent with similar provisions in the WCAG 1.0, however, the final rule uses language which is more consistent with enforceable regulatory language.

It can be argued that 1194.22(j) is actually more restrictive because most flickering can be controlled in the major browsers by pressing the Escape key.

Keywords	Section 508	Comparison	WCAG Priority 1
Text only last resort	**1194.22 (k)** A text-only page, with equivalent information or functionality, shall be provided to make a Web site comply with the provisions of this part, when compliance cannot be accomplished in any other way. The content of the text-only page shall be updated whenever the primary page changes.	The same	**11.4** If, after best efforts, you cannot create an accessible page, provide a link to an alternative page that uses W3C technologies, is accessible, has equivalent information (or functionality), and is updated as often as the inaccessible (original) page.
Scripting	**1194.22 (l)** When pages utilize scripting languages to display content, or to create interface elements, the information provided by the script shall be identified with functional text that can be read by assistive technology.	WCAG more restrictive	**6.3** Ensure that pages are usable when scripts, applets, or other programmatic objects are turned off or not supported. If this is not possible, provide equivalent information on an alternative accessible page. (Priority 1) **6.4** For scripts and applets, ensure that event handlers are input device-independent. (Priority 2) **8.1** Make programmatic elements such as scripts and applets directly accessible or compatible with assistive technologies. [Priority 1 if functionality is important and not presented elsewhere; otherwise Priority 2.] **9.3** For scripts, specify logical event handlers rather than device-dependent event handlers. (Priority 2)

As discussed in *The WCAG View* table, if pages satisfy Checkpoint 6.3, it means that scripts are not involved with essential or important content (not conveying information) and thus would not require text that can be accessed by assistive technology. They would pass 1194.22(l).

Two of the WCAG Priority 2 checkpoints (6.4 and 9.3) stress the need for accessibility of event handlers, primarily for keyboard access. This focus is not reflected in the Section 508 Web standards. Note that keyboard access is required in the software standards, 1194.21(a), but that does not apply to Web content.

The most important comparison between the Section 508 standard for scripts and the checkpoints of WCAG is the Priority 2/1 Checkpoint 8.1 which requires that scripts be directly accessible or compatible with assistive technology. My interpretation of "compatible with assistive technology," is that it is essentially that which Paragraph 1194.22 (l) requires. If Checkpoint 6.3 were not present, I would say that the requirements on scripts from the Web Accessibility Initiative (including Priority 2) is similar to that from Section 508.

However, there is a puzzling inconsistency in the WCAG checkpoints. Checkpoint 8.1 is listed with the Priority 2 items, yet for important functionality it is supposed to be Priority 1. On the other hand, checkpoint 6.3 (Priority 1) requires that pages be usable with scripts and applets turned off. It seems to me that Checkpoint 6.3 trumps Checkpoint 8.1 and important scripts are not allowed, whereas accessible scripts (those satisfying 8.1) are allowed by 1194.22 (l).

Keywords	Section 508	Comparison	WCAG Priority 1
Applets and plug-ins	**1194.22 (m)** When a Web page requires that an applet, plug-in or other application be present on the client system to interpret page content, the page must provide a link to a plug-in or applet that complies with §1194.21(a) through (l).	Similar	**6.3** Ensure that pages are usable when scripts, applets, or other programmatic objects are turned off or not supported. If this is not possible, provide equivalent information on an alternative accessible page. (Priority 1) **6.4** For scripts and applets, ensure that event handlers are input device-independent. (Priority 2) **8.1** Make programmatic elements such as scripts and applets directly accessible or compatible with assistive technologies. [Priority 1 if functionality is important and not presented elsewhere; otherwise Priority 2.]

The intent of the Section 508 software standards (§1194.21(a) through (l)) is to have specific requirements that will insure that software is directly accessible and/or compatible with assistive technology. Thus, if Web sites satisfy 1194.22 (m) then they will comply with WCAG checkpoints 6.4 and 8.1. However, they will not necessarily comply with the Priority 1 WCAG checkpoint 6.3.

Keywords	Section 508	Comparison	WCAG Priority 1
Forms	**1194.22 (n)** When electronic forms are designed to be completed on-line, the form shall allow people using assistive technology to access the information, field elements, and functionality required for completion and submission of the form, including all directions and cues.	Similar	**10.2** Until user agents support explicit associations between labels and form controls, for all form controls with implicitly associated labels, ensure that the label is properly positioned. (Priority 2) **12.4** Associate labels explicitly with their controls. (Priority 2) **9.3** For scripts, specify logical event handlers rather than device-dependent event handlers. (Priority 2)

The key to accessible forms is for a person using assistive technology to be able to identify the purpose of any form control element and to be able to manipulate it. Knowing the intent of the input element is the purpose of WCAG Priority 2 checkpoints 10.2 and 12.4. WCAG checkpoint 9.3 would ensure that the form could be manipulated with the keyboard.

Keywords	Section 508	Comparison	WCAG Priority 1
Skip navigation	**1194.22 (o)** A method shall be provided that permits users to skip repetitive navigation links.	Related to WCAG but Section 508 more specific	**13.5** Provide navigation bars to highlight and give access to the navigation mechanism. (Priority 3) **13.6** Group related links, identify the group (for user agents), and, until user agents do so, provide a way to bypass the group. (Priority 3)

The "skip navigation" provision of the Section 508 Standards is related to a couple of Priority 3 WCAG checkpoints, but the Section 508 standard is specific and direct. The WCAG checkpoints assume technology not yet supported, like grouping and labeling links.

Keywords	Section 508	Comparison	WCAG Priority 1
Timed responses	**1194.22 (p)** When a timed response is required, the user shall be alerted and given sufficient time to indicate more time is required.	Not in WCAG	

There are no comparable checkpoints in the Web Content Accessibility Guidelines.

How to Contact the National Center for the Dissemination of Disability Research

Call Us
Voice or Text Telephone
1-800-266-1832 or (512) 476-6861

Fax Us
(512) 476-2286

Explore Our Web Site
http://www.ncddr.org

E-Mail Us
jwestbro@sedl.org

Write Us
National Center for the Dissemination of Disability Research
Southwest Educational Development Laboratory
211 East Seventh Street, Suite 400
Austin, Texas 78701-3281

Visit Us
In downtown Austin, Texas, 4th floor,
Southwest Tower Bldg., Brazos at 7th St.

Accessible Multimedia and Distance Education Projects at NCAM

Geoff Freed
Project Manager
CPB/WGBH National Center for Accessible Media (NCAM)

Introduction

The CPB/WGBH National Center for Accessible Media (NCAM) is a research and development facility dedicated to the issues of media technology for disabled people in their homes, schools, workplaces, and communities. NCAM's mission is to expand access to present and future media for people with disabilities; to explore how existing access technologies may benefit other populations; to represent its constituents in industry, policy and legislative circles; and to provide access to educational and media technologies for special needs students.

NCAM is also pioneering the use of accessible multimedia, both on the Web and in the classroom, through projects which educate software and hardware developers, empower students and teachers, design new media access devices and procedures, and in general help assure that disabled people can reap the benefits of electronic and educational media.

One project at NCAM is expected to have a particularly wide effect on accessible multimedia on the Web and in the classroom. The Media Access Generator (MAGpie), NCAM's digital captioning application, originally released in mid-2000, is currently being redeveloped for re-release in September 2001. Intended to simplify the process of adding closed captions and audio descriptions to digital media, MAGpie 2.0 will expand and improve the application's original capabilities. Other projects introduced include Access to PTVoT and the eDescription Project.

MAGpie 2.0

Developers of Web- and CD-ROM-based multimedia need an authoring application for making their materials accessible to persons with disabilities. MAGpie allows authors to add captions and audio descriptions to multimedia in two formats used by several popular players. Because it is Java-based, MAGpie 2.0 will work nearly identically on both the PC and Macintosh. MAGpie may be downloaded at no charge from **http://ncam.wgbh.org/webaccess/magpie.**

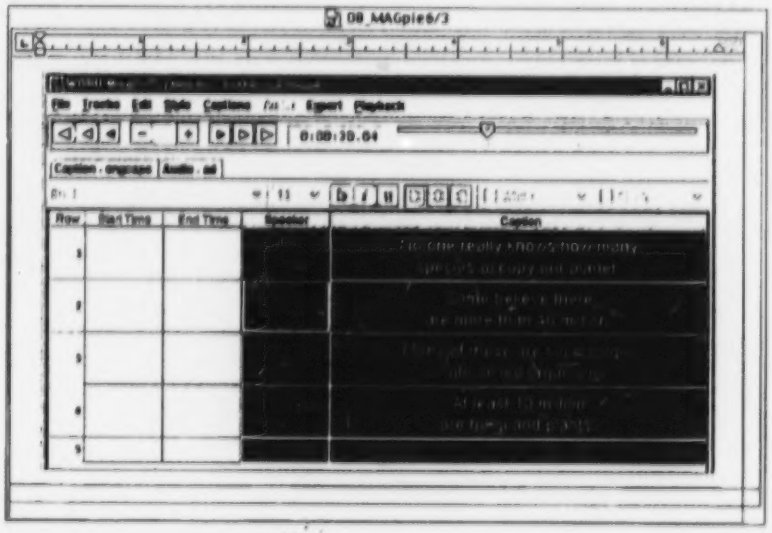
Adding captions to multimedia with MAGpie 2.0

The MAGpie 2.0 caption interface is based on a grid, as shown below.

The user can transcribe the original media's soundtrack into discrete caption cells, or import the transcript from an existing external file. After formatting the text into separate captions and applying stylistic effects such as colored text or backgrounds, timecodes are assigned to the captions by playing the original media and pressing a single key once per caption. Captions can also be segmented so that individual words or phrases are highlighted at specific intervals, producing a read-along effect.

Once the captions have been properly formatted and timed, the user can combine the captions with the original media without exiting the application itself. Captions can be reviewed for timing accuracy and typographical errors, and corrections can be made in the editor. MAGpie can create a plain text transcript for export or printout. When the work is finished, the user can create a complete captioned multimedia presentation in two popular playback formats:

- SMIL (Synchronized Multimedia Integration Language) **http://www.w3.org/AudioVideo**,
  — Playable with the QuickTime Player, RealPlayer, or GRiNS Player; or
- Microsoft SAMI (Synchronized Accessible Media Interchange) **http://www.microsoft.com/enable/sami**
  — Playable with the Windows Media Player



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Accessible Multimedia and Distance Education Projects at NCAM, *continued from page 11*

Adding Audio Descriptions to Multimedia with MAGpie 2.0

The audio-description capabilities of MAGpie 2.0 have been greatly improved from the previous version of the software. The user can now record audio descriptions directly into MAGpie, instead of having to use a separate sound-recording application. Audio descriptions may be recorded to fit into existing pauses in the original media's soundtrack, or the user may choose to pause the media and insert an extended audio description. Timing is handled similarly to captions in that the user plays the original media and presses a single key to assign a playback timecode to each audio description. Audio descriptions may be reviewed, re-recorded or re-timed as necessary before automatically integrating them into a QuickTime, RealPlayer or GRiNS SMIL presentation. (Microsoft's SAMI format does not currently support audio descriptions.)

Using MAGpie in the Classroom

Teachers of deaf and hard-of-hearing students have long used captioned media on videotape to make educational programs more accessible to their students. Other educators are also discovering the many and varied uses of captioning. Teachers of English as a second language find that listening to and seeing English improves their students' ability to learn new vocabulary and enhances their reading fluency. Middle and high-school teachers report that captioned video provides just the hook they need to motivate students to read. Once students' attention is captured by a favorite program, the teacher can turn off the sound and students must read the captions to find out what happens. Teachers of disabled students appreciate the multisensory nature of captioned television. The rich visual images help many students make sense of the spoken language and print. Moreover, students are more willing to re-read a videotape, which adds to their reading fluency and comprehension.

Students benefit in many ways from the classroom use of captioning. Both the process of writing captions and creating a finished product to show others contribute to the learning value of captioning. Like captions, audio descriptions also can help students gain better understanding in the classroom. See a description of NCAM's eDescription project, below, for more details.

Funding for MAGpie 2.0 is provided by the Mitsubishi Electric America Foundation (MEAF; **http://www.meaf.org**) and the National Institute on Disability and Rehabilitation Research (NIDRR) (**http://www.ed.gov/offices/OSERS/NIDRR**), U.S. Department of Education; and by the Trace Research and Development Center (**http://www.trace.wisc.edu**) at the University of Wisconsin.

Access to PIVoT

One project at NCAM in which MAGpie figures prominently is a collaboration with the Massachusetts Institute of Technology's Center for Advanced Educational Services (**http://www.ceci.mit.edu/projects/pivot/**) to make an on-line interactive physics course accessible to students with disabilities. Known as Access to PIVoT (Physics Interactive Video Tutor), this project is testing, implementing, documenting and promoting the development of multimedia access solutions to make distance learning accessible to blind, low-vision, deaf and hard-of-hearing students.

The Access to PIVoT project is built around MIT Professor Walter Lewin's popular introductory physics class. Web-based components include a complete digitized library of Professor Lewin's physics lectures as well as dozens of help sessions, interactive demonstrations and simulations, quizzes and a full on-line textbook. Using the questions provided in an extensive FAQ list, students can choose second- and third-level follow-up questions, invoking appropriately linked video responses by the professor. Students will be able to get even more detailed information by typing in questions and receiving responses from an on-line teaching assistant.

Building upon NCAM's ongoing research into Web-based multimedia accessibility, the PIVoT project has developed a method for students to use MAGpie to create captions and audio descriptions for the video tutorials on the Web site. Testing and evaluation with disabled and non-disabled students and professionals is helping to gauge the usefulness of these accessibility enhancements. Please visit the PIVoT Web site at NCAM (**http://ncam.wgbh.org/webaccess/pivot/index.html**) for more information.

Funding for Access to PIVoT is provided by the National Science Foundation (**http://www.nsf.gov**) and by The Mitsubishi Electric America Foundation (**http://www.meaf.org**).

The eDescription Project

In the fall of 2000, NCAM launched the eDescription project to study ways to adapt broadcast-description methods for use with classroom media, in order to improve access to curricula for visually impaired students. Accurate and effective verbal description is essential for students with limited vision if they are to access the information embedded in today's visual media.

NCAM will analyze, amend and expand current description practices to create an eDescription methodology, which will build on current research on cognition in children who are visually impaired. Working with a team of highly qualified advisors, NCAM will explore the potential of eDescription to provide access to content and meaning in software, video, illustration and other visual materials. The eDescription project will also contribute to the advancement of theory, knowledge and practices related to the use of eDescription as an instructional tool.

eDescription will include **extended descriptions**, defined as the communication of key visual information which requires a longer time period than that allowed by natural pauses in the media. Using MAGpie, the eDescription project will extend narrative elements by pausing the program video image while a description continues. In this way it will be possible to provide the student with a far more complete conceptual picture of what is appearing visually.

eDescription will make it possible to include additional details that children with vision pick up incidentally, thus supplementing the general knowledge acquired by the students with vision loss. eDescription will also include **enhanced descriptions**, defined as additional information and cues specifically designed to address cognition issues experienced by children with visual impairment. Together, these techniques constitute an entirely new approach, which will result in **educational descriptions**.

Project results will serve all children with visual impairments but will most notably address challenges faced by mainstreamed students and general education teachers. These results will apply to video, graphics, animation, illustrations, etc., presented and delivered in wide variety of media. Future delivery methods for eDescription files are many and scalable — from an audio tape delivered via regular mail to Web-delivered audio direct from the publisher or from a server of a designated educational site or via digital television.

Funding for the eDescription project is provided by the U.S. Department of Education's Office of Special Education Programs (**http://www.ed.gov/offices/OSERS/OSEP**) through the Steppingstones of Technology Innovation for Students with Disabilities Program.

Further Information

NCAM's Access to Rich Media project (**http://ncam.wgbh.org/richmedia**) is an excellent resource for anyone interested in learning more about MAGpie and accessible multimedia. Visitors to this site will find a listing of applications used to create various types of multimedia, tutorials on creating captioned and described movies, and information on current research to help developers understand and deal with accessibility issues. Tutorials on adding captions and audio descriptions to multimedia, and making other forms of rich media accessible, may be found here, as well. Finally, users may download MAGpie or view many examples of accessible multimedia, many of which were created with MAGpie.

Funding for the Rich Media Accessibility resource center provided by the National Institute on Disability and Rehabilitation Research (NIDRR), U.S. Department of Education.

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AbilityForum.com Offers a Dissemination Avenue to Reach Consumers

Dawn Golden
Project Leader
AbilityForum.com

The **AbilityForum.com** Web site is being developed under a NIDRR-funded Small Business Innovative Research (SBIR) program to provide a community resource for persons with disabilities. The site features an on-line job center, a resource area with disability resources, educational and assistive technology information, and opportunities for social support. The site has been operating approximately one year and is currently accessed by 12,000 consumers a month across the country. The user base is growing rapidly. The site is designed to meet accessibility standards. Please visit: **http://www.abilityforum.com**

AbilityForum.com invites you to post your product, research or agency information on the site. Agencies can be listed in the *Resource Locater*. Products can be listed in the *Assistive Technology* area and can also be marketed through the *E-commerce* capability. Feature research articles can be included in the *News and Events* area. The team can also provide support to your organization by reviewing your site to see if it meets accessibility standards.

The project is led by a team of three engineers and two support personnel working together virtually across three states and five cities. Dawn Golden is the project leader with a background in Biomedical and Electrical Engineering. "Ten years ago I was introduced to the field of assistive technology and I was fascinated by how computers could be used to overcome disabilities. The Internet offers a whole new frontier for accessibility by offering social interaction, e-commerce, distance learning, telecommuting opportunities and other links to the community. The goal is to offer those great Internet opportunities in an accessible manner." Extensive research is being done through the Internet, periodicals, conferences and networks of agencies and resource centers as well as partnering arrangements. "There are so many resources out there for persons with disabilities that can now be readily used by consumers through our site."

For more information, visit **http://www.abilityforum.com** or contact:

Dawn Golden
dgolden@abilityforum.com
http://www.abilityforum.com
Community Access through Technology

Section 508 and Web Accessibility Resources

Many people are familiar with the Web Content Accessibility Guidelines (WCAG) developed through the Web Accessibility Initiative (WAI) of the World Wide Web consortium. What differences are there between the Priority 1 level of the WCAG and the standards for Section 508? A brief discussion of the major differences is presented here, based on the "Side-by-Side" comparison sponsored by the Association of Tech Act Projects (ATAP) and developed by Jim Thatcher (see **Special Supplement for Web Designers**). The WCAG checkpoints and Section 508 standards are presented with an explanation of the differences or what would be required to meet the checkpoint or standard.

An annotated listing of Web-based resources on Section 508 and Web accessibility follows the comparison of differences in WCAG and Section 508.

If a Web site is WCAG A-Compliant and its author wants to be Section 508 compliant as well, these are the five standards she or he must also address: paragraphs 1194.22 (l), (m), (n), (o), and (p).

1194.22 (l) When pages utilize scripting languages to display content, or to create interface elements, the information provided by the script shall be identified with functional text that can be read by assistive technology.

If pages satisfy WCAG Checkpoint 6.3, it means that scripts are not involved with essential or important content (not conveying information) and thus would not require text that can be accessed by assistive technology.

1194.22 (m) When a Web page requires that an applet, plug-in or other application be present on the client system to interpret page content, the page must provide a link to a plug-in or applet that complies with 1194.21(a) through (l).

The WCAG checkpoint is much easier to interpret, your pages have to be usable when scripts, applets and other programmatic objects are turned off. If your page satisfies this checkpoint then it is likely that you also satisfy the corresponding Section 508 standards cited above.

1194.22 (n) When electronic forms are designed to be completed on-line, the form shall allow people using assistive technology to access the information, field elements, and functionality required for completion and submission of the form, including all directions and cues.

The key to accessible forms is for a person using assistive technology to be able to identify the purpose of any form control element and to be able to manipulate it. Knowing the intent of the input element is the purpose of WCAG Priority 2 checkpoints 10.2 and 12.4. WCAG checkpoint 9.3 would ensure that the form could be manipulated with the keyboard.

1194.22 (o) A method shall be provided that permits users to skip repetitive navigation links.

The "skip navigation" provision of the Section 508 Standards is related to a couple of Priority 3 WCAG checkpoints, but the Section 508 standard is specific and direct. The WCAG checkpoints assume technology not yet supported, like grouping and labeling links.

1194.22 (p) When a timed response is required, the user shall be alerted and given sufficient time to indicate more time is required.

There are no comparable checkpoints in the Web Content Accessibility Guidelines.

If a Web site is 508-compliant and its author wants to be Web Accessibility Initiative A-Compliant as well, there are four additional checkpoints to address: WCAG Priority 1 checkpoints 1.3, 4.1, 6.2, and 14.1.

WCAG Checkpoint 1.3 Until user agents can automatically read aloud the text equivalent of a visual track, provide an auditory description of the important information of the visual track of a multimedia presentation.

Given the Web environment it is natural to assume that the synchronized text equivalent could be displayed in a window next to (or above or below) the video, just like captions. The problem addressed by WCAG 1.3 is that blind users, for whom this is important, do not have access to that text today, as their screen readers won't read the descriptions of the video. Until they do, WCAG 1.3 requires that the text description of the video be presented in audio.

WCAG Checkpoint 4.1 Clearly identify changes in the natural language of a document's text and any text equivalents (e.g., captions).

The intent of 4.1 is to for Web authors to indicate change in natural language with markup (lang="en"), not using in-line text, like "the following is in German." Not many assistive technologies support language change markup. Based on that determination, the Access Board decided not to include this checkpoint as a standard for Section 508.

WCAG Checkpoint 6.2 Ensure that equivalents for dynamic content are updated when the dynamic content changes.

The Access Board did not include this checkpoint in the Section 508 standards for Web accessibility because it was deemed unclear.

WCAG Checkpoint 14.1 Use the clearest and simplest language appropriate for a site's content.

The Access Board decided against including this checkpoint as a standard for Web accessibility because it was deemed too difficult to enforce. The requirement to use clearest and simplest language can be very subjective.

Thatcher, J. W. (2001). Section 508 Web Standards and WCAG Priority 1 checkpoints: A side-by-side comparison. Retrieved July 25, 2001 from **http://jimthatcher.com/sidebyside.htm**

The following is an annotated listing of Web-based resources regarding:

- Section 508 and Web Accessibility
- Corporate/Accessibility Websites
- Web Accessibility Verifiers
- News Items on 508 and Accessibility

Section 508 and Web Accessibility

http://www.ittatc.org/
The ITTATC promotes the development of accessible electronic and information technology by providing technical assistance, training and information.

http://www.ittatc.org/training/webcourse/
ITTATC Web Accessibility Course (online, free of charge)

http://www.ittatc.org/publications/assistance1.cfm?category=101
Accessible Design Methods (online articles and documents)

http://www.ittatc.org/resources/referrals.cfm
Referrals for companies seeking to comply with Section 508 of the Rehabilitation Act and Section 255 of the Telecommunications Act

http://www.ittatc.org/training/calendarByMonth.cfm?
Calendar of events (training events, some are free of charge)

http://www.section508.gov/
Section 508: The Road to Accessibility

http://www.section508.gov/Training.htm
Training opportunities for a variety of roles

http://vba1.interactive-media.com/508
Welcome to the 508 Universe!
Designing Accessible Web sites (online course, free of charge)

http://www.access-board.gov/
The Access Board

http://www.access-board.gov/508.htm
Section 508 of the Rehabilitation Act: Electronic and Information Technology Accessibility Standards
Technical Assistance to Ensure Successful Implementation

http://www.access-board.gov/sec508/FAQ.htm
Questions & Answers about Section 508 of the Rehabilitation Act Amendments of 1998

http://www.access-board.gov/sec508/guide/1194.22.htm
Web-based Intranet and Internet Information and Applications (1194.22)
These provisions of the standards are the requirements that must be followed by Federal agencies when producing Web pages.

http://www.usdoj.gov/crt/508/
Department of Justice Section 508 Home Page

http://www.usdoj.gov/crt/508/web.htm
Section 508 Self-Evaluation Web Page Accessibility Questionnaire for Component Web Contacts
(*with* Technical Assistance Material)
This document is designed to help agencies evaluate whether their Internet pages are accessible to people with disabilities.

http://www.usdoj.gov/crt/508/web2.htm
Section 508 Self-Evaluation Web Page Accessibility Questionnaire for Component Web Contacts
(*without* Technical Assistance Material)

http://www.usdoj.gov/crt/508/508law.html
PL 105-220, enacted on August 7, 1998, 112 Stat 936
codified as: Section 504 of the Rehabilitation Act, 29 U.S.C. § 794d
Workforce Investment Act of 1998
Sec. 508. Electronic and Information Technology

http://www.accessibilityforum.org/
The Accessibility Forum is an ongoing collaboration among stakeholders affected by Section 508 including user, industry, government, and other communities in order to benefit employees and members of the public with disabilities.

http://www.adata.org/
ADA Technical Assistance Program
Your comprehensive resource for information on the Americans with Disabilities Act

http://jimthatcher.com/sidebyside.htm
Section 508 Web Standards and WCAG Priority 1 Checkpoints: A Side-by-Side Comparison

http://www.icdri.org/disability-comp.html
Analysis of WCAG and Section 508 by Disability Type

http://www.tvworldwide.com/event_ittatc_061801.cfm
Making final preparations for Section 508.
Archive of live Webcast held June 18, 2001 with real time captioning. Sponsored by the ITTATC.

http://www.usability.gov/
National Cancer Institute
Your resource for designing usable, useful, and accessible Web sites

http://www.rit.edu/%7Eeasi/itnews/index.htm
IT-News is a constantly rotating set of news items on Information Technology, accessibility and users with disabilities.

http://ncam.wgbh.org/
The CPB/WGBH National Center for Accessible Media (NCAM) is a research and development facility dedicated to the issues of media technology for disabled people in their homes, schools, workplaces, and communities.

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Section 508 and Web Accessibility Resources, *continued from page 15*

Corporate/Accessibility Websites

http://access.adobe.com/
Welcome to access.adobe.com, a resource designed to help people with visual disabilities work more effectively with Adobe® Acrobat® software and Adobe Portable Document Format (PDF) files.

http://www.apple.com/disability/
People with Special Needs
Since 1985 Apple has been deeply committed to helping people with special needs attain an unparalleled level of independence through a personal computer.

http://www.awarecenter.org/
AWARE stands for Accessible Web Authoring Resources and Education, and our mission is to serve as a central resource for Web authors for learning about Web accessibility.

http://www.awarecenter.org/why/myths.html
Common myths about Web accessibility

http://www-3.ibm.com/able/
IBM takes pride in our Accessibility Center, bringing together product and service information for people with disabilities, and for Human Resource Professionals who are proactively seeking knowledge about solutions or empowering persons with disabilities to ensure a productive working environment.

http://www.macromedia.com/macromedia/accessibility/
Macromedia — Accessibility Resource Center
Macromedia supports the creation of great Web experiences for everyone. We encourage Web developers to produce rich, engaging content that is accessible by all.

http://www.microsoft.com/enable/
Microsoft Accessibility, empowering people through great software. Microsoft is dedicated to developing technology that is useable and accessible to everyone, including those with disabilities.

http://trace.wisc.edu/world/web/
Designing More Usable Web Sites

http://www.w3.org/WAI/
Web Accessibility Initiative (WAI)
WAI, in coordination with organizations around the world, pursues accessibility of the Web through five primary areas of work: technology, guidelines, tools, education and outreach, and research and development.

Web Accessibility Verifiers

http://www.cast.org/bobby/
Welcome to Bobby 3.2. Bobby is a free service provided by CAST to help Web page authors identify and repair significant barriers to access by individuals with disabilities.

http://aprompt.snow.utoronto.ca/
A-Prompt (Accessibility Prompt) has been developed to assist Web authors in improving the accessibility and usability of HTML documents.

http://www.temple.edu/inst_disabilities/piat/wave
WAVE 2.01 helps you check if your page is accessible to people with disabilities.

News Items on 508 and Accessibility

http://www.wired.com/news/print/0,1294,39563,00.html
Smart Biz: Enabling the Disabled
November 3, 2000 *Wired News*
by Karen Solomon

http://pcworld.com/resource/printable/article/0,aid,17690,00.asp
Locking Out the Disabled. Office buildings have wheelchair ramps, TV has closed captions, but many Web sites are inaccessible to people with disabilities. Things don't have to be that way.
September 2000 *PC World*
By Judy Heim

http://www.nwfusion.com/news/2001/0611specialfocus.html
Web site accessibility goes mainstream. Navigation Tools — Federal disability access rules will trickle down to corporate Web sites.
June 11, 2001 *Network World*
By Carolyn Duffy Marsan

http://www.gcn.com/vol20_no19/news/4636-1.html
Uphill toward 508. It's a work in progress, feds say
July 16, 2001; Vol. 20 No. 19, *Government Computer News*
By Dipka Bhambhani

http://www.gcn.com/vol20_no19/news/4628-1.html
Luigart links innovation, 508
July 16, 2001; Vol. 20 No. 19, *Government Computer News*
By Richard W. Walker

Who's in the News

NCDDR staff are on the lookout for popular and disability media pieces that present research funded by NIDRR. In this issue, we share news items from ***BusinessWeek Online***, the ***Atlanta Business Chronicle***, and the ***New York Times***. Please let us know when an item representing your NIDRR-funded project appears in the media.

Call us, 1-800-266-1832 or send an email to the NCDDR **pcastanc@sedl.org** and we will review the item for *Who's in the News*. You may also use an online form: **http://www.ncddr.org/forms/submitnews.html**

BusinessWeek Online magazine posted an article entitled *A Chat with Microsoft's Steve Ballmer* on June 13, 2001. The article focuses on IT accessibility and Section 508. In an interview, Microsoft CEO Steve Ballmer lays "out the reasons for Microsoft's unwavering focus on accessibility, and what he sees as the benefits to the company and to people with disabilities."

Acknowledged in the article is the ongoing working relationship between the Trace Research and Development Center at the University of Wisconsin-Madison and Microsoft. In Ballmer's discussion of Microsoft's goal of "making computers easier for people to use," he states, "In 1988, working with the Trace Research and Development Center at the University of Wisconsin, Madison, we focused on making one of the earliest versions of Windows — Windows 2.0 — more accessible for people who are blind, deaf, or have limited dexterity." In Microsoft's efforts to view "accessibility more broadly in our own product design," Ballmer elaborates further on Microsoft's relationship with the Trace Center. "Working with the Trace Center and others, Microsoft codified specific guidelines that explain how to evaluate and improve accessibility. We published the Windows Guidelines for Accessible Software Design and other technical assistance for consumers and developers, which can be found on our Accessibility Web site."

The article was written by *BusinessWeek Online* Assistive Technology columnist, **John M. Williams**. Mr. Williams, who "has 25 years of experience writing about disability issues," writes a weekly column about disability issues for *BusinessWeek Online*. The full article on IT accessibility can be found at **http://www.businessweek.com/bwdaily/dnflash/jun2001/nf20010613_081.htm**

The Trace Center administers two NIDRR-funded Rehabilitation Research and Engineering Centers — the RERC on Information Technology Access and the RERC on Access to Telecommunications. For further information contact **The Trace Center** at **608-262-6966** or email: **info@trace.wisc.edu**

The ***Atlanta Business Chronicle*** published an article in their Health Care Quarterly Report section entitled *Telemedicine Takes Off* on July 20, 2000. The article focuses on the emerging trend of using telemedicine technology as an alternative in extending health care beyond the confines of the physician's office or hospital. According to the article, not only does the use of telemedicine reduce health-care costs, it can also facilitate the management of patients' conditions at their homes.

Featured in the article is a new NIDRR-funded telemedicine project at the Shepherd Center, "one of the top specialty hospitals in the country for treating patients with spinal cord and brain injuries." The telemedicine project is geared towards "the construction of the first computer network to link adults with disabilities to an Internet-based system designed to meet their specific needs." According to Shepherd Center staff, electronic health-care follow-up with their patients has become increasingly important due to the "shorter lengths of stay for patients because of managed-care constraints." Through the new telemedicine project, Shepherd Center staff has the ability to assist patients with health-related problems encountered at home after their discharge from the hospital.

The article was written by **Julie Bryant**, a staff writer with the *Atlanta Business Chronicle*, a weekly newspaper with a circulation of over 40,000. Active marketing by the Shepherd Center's media relations department resulted in Ms. Bryant's interest in writing the article. The media relations manager at the center promoted the "story idea" to the journalist and facilitated the gathering of information.

The Shepherd Center administers three NIDRR-funded projects–Georgia Regional Spinal Cord Injury Care System, Telerehabilitation to Support Assistive Technology, and Aging and Adjustment After Spinal Cord Injury: A Twenty-Five Year Longitudinal Study.

For more information contact **Kim Lathbury**, Shepherd Center Media Relations Manager, at **kim_lathbury@shepherd.org** or **404-350-7708**.

On June 19, 2001, the ***New York Times*** published an online article in their Health section entitled *Studying the Autoimmune Disease Puzzle*. Noted in the article are the processes of autoimmune diseases and the disproportionate affliction rate between men and women, where women are more likely to be diagnosed with such diseases.

The article includes a citation of the research conducted by Sara E. Walker, M. D., MACP, a Missouri Arthritis Rehabilitation Research and Training Center (MARRTC) researcher. Walker's research, along with other research noted in the article, suggests that hormones and a woman's reproductive role may be contributing factors to the development of autoimmune diseases. According to the article, Dr. Walker proposes "that women may be at risk for autoimmune conditions not because they have too much estrogen, but because they have too little

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testosterone." Walker researches the autoimmune disease known as systemic lupus erythematosis, and has had "success in treating people with lupus with a particular hormone suppressant."

The article was written by *New York Times* reporter **Natalie Angier**. Ms. Angier contacted Dr. Walker concerning her research on the treatment of lupus patients after Walker presented the results at the 167th annual national meeting of the American Association for the Advancement of Science (AAAS) in February, 2001 in San Francisco.

As a MARRTC researcher, Dr. Walker is co-investigator of two other arthritis-related research projects. She is currently a Professor of Internal Medicine of the School of Medicine at the University of Missouri-Columbia.

For more information contact **Dianna Borsi O'Brien**, MARRTC Senior Information Specialist, at **obriendl@missouri.edu** or **573-882-2914**.

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Success Stories 2001 will highlight examples received by December 1, 2001.

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NIDRR Grantee and Staff Recognition

The NCDDR continues to share the recognition given to NIDRR-funded researchers and their staff. All grantees are encouraged to send this information to the NCDDR for future issues. Email pcastane@sedl.org, call 1-800-266-1832, or use the online form available on the NCDDR Web site: **http://www.ncddr.org/forms/submitrecog.html**

The **Trace Research and Development Center** and its director were recently recognized at the Rehabilitation Engineering and Assistive Technology Society of North America's (RESNA) 2001 annual conference in Reno, NV. The awards were presented at RESNA's 2001 annual conference on June 22-26, 2001. The *2001 RESNA Leadership Award* was awarded to the Trace Center and according to RESNA is presented to organizations that have "contributed to the advancement of assistive technology, have a contribution that has impacted a major segment of the population, and maintains recognition and support for RESNA."

In addition, **Dr. Gregg C. Vanderheiden**, Director of the Trace Center, received a certificate of appreciation for his work on technology access for individuals with disabilities. The certificate of appreciation is for "creative endeavor and outstanding achievement in promoting the advancement of rehabilitation through technology." RESNA is comprised of 1,700 members in 31 countries. Vanderheiden is Director and Principal Investigator of the RERC on Information Technology Access and the RERC on Access to Telecommunications at the Trace Center, University of Wisconsin-Madison.

The Trace Research and Development Center's Web site was recently selected as a TopTen website for TenLinks.com, a CAD directory for engineers, designers, architects, and other technical professionals. The site was placed in Computing for the Disabled at **http://www.tenlinks.com/CAD/products/disabled.htm**

According to TenLinks.com, sites are chosen based solely on their content and relevance to CAD-related information, and they "have experts combing through the Internet cataloging and ranking the best and most useful sites." Their links are checked and updated continually to ensure having the "best" sites on the Internet, thus "since the Internet is always changing, so are our *TopTen* lists." TenLinks.com has received awards and commendations from various sources in categories such as presentation, quality, accessibility, design, content, and originality.

For information on the Trace Research and Development Center items contact **The Trace Center** at **608-262-6966** or email: **info@trace.wisc.edu**

The **Shepherd Center** was recently recognized as "*one of the country's top rehabilitation hospitals*" in the U. S. News and World Report's annual edition of "*America's Best Hospitals*." The edition, released on July 13, 2001, is the 12th annual listing of top hospitals that are ranked according to individual specialties. According to the methodology used by the U. S. News and World Report survey, rankings in the rehabilitation category are based on reputation alone. One hundred and fifty randomly selected board certified physicians are asked "to identify up to five hospitals they consider tops in their specialty, regardless of cost or location. The reputational score shows the percentage of the doctors surveyed over the past three years who chose a hospital." The Shepherd Center, which administers three NIDRR-funded projects (Georgia Regional Spinal Cord Injury Care System, Telerehabilitation to Support Assistive Technology, Aging and Adjustment After Spinal Cord Injury: A Twenty-Five Year Longitudinal Study) was ranked 18th out of 20 with a score of 3.9 percent.

For more information contact **Kim Lathbury**, Shepherd Center Media Relations Manager, at **kim_lathbury@shepherd.org** or **404-350-7708**.

Fifteen other current NIDRR grantees were also recognized among the best hospitals in the area of rehabilitation:

- Rehabilitation Institute of Chicago
- The Institute for Rehabilitation and Research, Houston
- University of Washington Medical Center, Seattle
- Kessler Institute for Rehabilitation, West Orange, New Jersey
- Mayo Clinic, Rochester, Minnesota
- Craig Hospital, Englewood, Colorado
- Ohio State University Medical Center, Columbus
- Thomas Jefferson University Hospital, Philadelphia
- Rancho Los Amigos Medical Center, Downey, California
- University of Michigan Medical Center, Ann Arbor
- Spaulding Rehabilitation Hospital, Boston
- National Rehabilitation Hospital, Washington, D.C.
- Mount Sinai Medical Center, New York
- Johns Hopkins Hospital, Baltimore
- Albert Einstein Medical Center (Moss Rehabilitation Hospital), Philadelphia

The **Disabilityworld.org** Web site was granted an award for being a "pioneering Web site" by the Changemakers.net Web site. Although the annual award has no specific name, the Web site is recognized for its "quality" by Changemakers.net, considered "the Web's first and only portal on social entrepreneurship worldwide" whose mission is "to provide inspiration, resources, and opportunities for those interested in social change throughout the world."

DisabilityWorld is a bimonthly Web-zine of international disability news and views and is dedicated to advancing an exchange of information and research about the international independent living movement of people with disabilities. It is a major component of the NIDRR-funded project, IDEAS for the New Millennium housed at the World Institute on Disability (WID).

For information contact **Kathy Martinez**, Disabilityworld.org Project Director, World Institute on Disability at kathy@wid.org or **510-251-4326** or **Jennifer Geagan**, Disabilityworld.org Project Manager at **jennifer@wid.org** or **510-251-4310**.

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Christy Clark, a vocational counselor and graduate research assistant with the Arthritis Rehabilitation Center: Training in Careers (ARCTIC), was awarded the *Regional Commission's Citation for Excellence* on April 5, 2001 at an honors banquet in Kansas City, MO. A research project of the **Missouri Arthritis Rehabilitation Research and Training Center (MARRTC)**, the ARCTIC provides assistance to individuals "who have work-related functional limitations due to arthritis continue working." Presented by the Social Security Administration (SSA), the annual award is given only to four to eight persons in the region comprised of Missouri, Kansas, Nebraska, and Iowa. Clark was cited for excelling "beyond expectations, often handling more cases than full-time caseworkers, without compromising accuracy or the care and concern extended to clients." In addition, Clark works with the Disability Determination Services Office of the SSA, has a master's degree in rehabilitation counseling, and is pursuing a doctoral degree in counseling psychology at the University of Missouri-Columbia.

Sara E. Walker, M. D., MACP, was recently elected President-elect of the American College of Physicians-American Society of Internal Medicine (ACP-ASIM). A researcher with the **Missouri Arthritis Rehabilitation Research and Training Center (MARRTC)**, Dr. Walker will commence the annual term as President-elect of ACP-ASIM on March 31, 2001 and subsequently assume the presidency in April, 2002. With a membership of more than 115,000 internal medicine physicians and medical students, the ACP-ASIM is "the nation's largest medical specialty society." During her long-term affiliation with the ACP, Dr. Walker served in several committees, became a Fellow in 1973, was elected a Master in 1996 and was "cited for her extensive contributions to the medical literature: 73 investigative publications; 16 clinical publications; 86 abstracts; and 16 book chapters."

Dr. Walker is a Professor of Internal Medicine of the School of Medicine at the University of Missouri-Columbia. She is co-investigator on two MARRTC projects–one that looks at depression and rheumatoid arthritis and another that focuses on developing a curriculum for arthritis health-care professionals.

For more information contact **Dianna Borsi O'Brien**, MARRTC Senior Information Specialist, at **obriendi@missouri.edu** or **573-882-2914**.

Forbes magazine recently published a "Best of the Web" list that included two NIDRR-related Web sites. The sites were selected as *Forbes.com Best of the Web* sites for the Health category "Disability Resources" during the summer 2001 issue. According to Forbes.com, sites are selected "based on their content, design, navigation, speed and customization." In a press release, Forbes.com acknowledged that their best of the Web sites for health-related information provide "a primer for those looking for solid medical advice on the Web." Nearly 3,000 sites were reviewed in order to develop the Forbes.com "Best of the Web" list. As one of the six main categories, the Health category contains sections on disability resources, diet, nutrition, fitness, and other topics. See **www.forbes.com/bow/**

The NIDRR-related "Best of the Web" sites included:

- The **ABLEDATA** Web site, abledata.com, contains information on assistive-technology products and the "best" feature as cited by Forbes is "The Reading Room links to articles and books on assistive technology." ABLEDATA is a NIDRR-funded project. For further information contact **Katherine Belknap**, Project Director, at **belknap@macroint.com** or **301-608-8998**.
- The **Center for Inclusive Design and Environmental Access' (IDEA Center)** Web site is noted for its "Bright Ideas page" and its links to housing information and universal design. IDEA is based at the State University of New York at Buffalo and administers the NIDRR-funded project, **RERC on Universal Design at Buffalo**. For further information contact **Steven Truesdale**, Assistant Director of the RERC, at **rercud@ap.buffalo.edu** or **716-829-3485, ext. 335**.

How To Contact The National Center for the Dissemination of Disability Research

Call Us
1-800-266-1832 or 512-476-6861 V/TT
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The Research Exchange is available in alternate formats upon request.

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